

IDENTIFICATION

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PRODUCT NAME: RK8E DRIVE CONTROL TEST
DATE CREATED: JANUARY 15, 1975
MAINTAINER: DIAGNOSTIC GROUP
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1. ABSTRACT

THE RK8E DRIVE CONTROL TEST IS DESIGNED FOR THE PURPOSE OF CHECKOUT OF THE RK8E DISK CONTROL LOGIC REQUIRING THE USE OF THE DISK DRIVE(S).

IN GENERAL, THE TEST IS AN INSTRUCTION TEST TO VERIFY BASIC OPERATION OF THE SEEK ONLY, RESTORE, WRITE DATA, READ DATA, WRITE ALL, AND READ ALL FUNCTIONS WITH ALL DRIVES ON THE CONTROL. SIMPLE COMPLEMENT DATA PATTERNS OF 2525 + 5252, 5252 + 2525, AND 2000 + 7777 ARE USED TO VERIFY ADDRESSING AND DATA TRANSFERS TO AND FROM EACH INDIVIDUAL DRIVE.

A MANUAL INTERVENTION TEST IS ALSO INCLUDED (SEE SECTION 5.7), TO ALLOW THE OPERATOR TO SELECT DATA PATTERNS AND COMMAND FUNCTIONS VIA THE SWITCH REGISTER.

CONSIDERING NO ERROR CONDITIONS, THE DRIVES THAT HAVE RUN THIS TEST ARE FORMATTED, IF THE PROGRAM WAS STOPPED AT END OF PROGRAM PASS COMPLETION BY SWR9=1.

2. REQUIREMENTS

2.1 HARDWARE

-
- A. PDP-8/A, 8/E, 8/F, OR 8/M COMPUTER OR OTHER FAMILY OF 8 COMPATIBLE COMPUTER WITH NECESSARY DW8E BUS ADAPTER.
 - B. AT LEAST 4K OF READ/WRITE MEMORY
 - C. ASR-33 TELETYPE OR EQUIVALENT
 - D. RK8E DISK CONTROL
 - E. RK05 DISK DRIVE(S)
 - F. UNFORMATTED OR FORMATTED 2200 BPI-1600 SECTOR PACK(S)

2.2 STORAGE

THE PROGRAM OCCUPIES OR UTILIZES LOCATION 0000 TO LOCATION 7400 OF THE CURRENT FIELD. IF THE CURRENT FIELD IS AN EXTENDED MEMORY FIELD, LOCATIONS 0000 TO 0003 OF FIELD 0, WILL BE USED FOR PROGRAM INTERRUPT SERVICE.

3. PRELIMINARY PROGRAMS

ALL BASIC AND EXTENDED MEMORY DIAGNOSTICS AND THE RK8E DISKLESS CONTROL TEST SHOULD BE RUN PRIOR TO THIS TEST.

4.

SWITCH REGISTER SETTINGS

- SWR0=1 SCOPE LOOP ON ERROR. AFTER AN ERROR HALT AT LOCATION "ERHLT9" RAISING THIS SWITCH AND PRESSING KEY CONTINUE WILL RESULT IN A SCOPE LOOP ON THE CURRENT FAILING TEST IF THE TEST CONTINUES TO FAIL. THE ERROR TYPEOUT AND THE ERROR HALT AT LOCATION "ERHLT9" WILL BE INHIBITED. THE TTY BELL WILL RING INDICATING AN ERROR IF SWR2=0.
- SWR1=1 SCOPE LOOP ON CURRENT NON-FAILING TEST. RAISING THIS SWITCH CAUSES THE PROGRAM TO LOOP ON THE CURRENT TEST IF THE TEST IS WORKING CORRECTLY. MAY BE USED IN CONJUNCTION WITH SWR0=1 FOR INTERMITTENT PROBLEMS.
- SWR2=1 INHIBIT BELL ON SCOPE LOOP. WHEN IN A SCOPE LOOP DUE TO SWR0=1, RAISING THIS SWITCH INHIBITS THE SCOPE LOOP ERROR BELL.
- SWR3=1 TEST ON CURRENT DRIVE.
UPON INITIAL START OF PROGRAM, WHEN "SINGLE DRIVE TESTING", RAISING THIS SWITCH INDICATES TO THE PROGRAM TO TEST THE DISK DRIVE IN SWR10-11. WHEN RUNNING THE PROGRAM AND "MULTI-DRIVE TESTING", RAISING THIS SWITCH INDICATES TO THE PROGRAM TO CONTINUE TO TEST THE CURRENT DRIVE UNDER TEST.
- SWR4=1 STOP PROGRAM OR HALT SWITCH. RAISING THIS SWITCH WILL RESULT IN A PROGRAM STOP UPON COMPLETION OF THE NEXT NON-FAILING TEST. IF POSSIBLE, THIS SWITCH SHOULD ALWAYS BE USED TO STOP THE PROGRAM.
- SWR5=1 INHIBIT THE RECOVERABLE ERROR HALT AFTER A RECOVERABLE ERROR TYPEOUT. AFTER AN ERROR HALT AT LOCATION "ERHLT9", RAISING THIS SWITCH AND PRESSING KEY CONTINUE WILL INHIBIT ALL FUTURE RECOVERABLE ERROR HALTS. IF SWR1=0 THE PROGRAM WILL PROCEED TO NEXT TEST AFTER EACH ERROR TYPEOUT, IF SWR1=1 THE PROGRAM WILL PROCEED BACK TO THE SAME OR CURRENT FAILING TEST.

(4, CONT'D.)

- SWR6=1 RECALIBRATE IN SCOPE LOOPS. RAISING THIS SWITCH WILL RESULT IN A DISK RECALIBRATION WHEN IN A SCOPE LOOP DUE TO SWR0=1, SWR1=1, OR WHEN SWR5=1.
- SWR7=1 PROGRAM WAIT LOOP FOR DISK IN SCOPE LOOPS. RAISING THIS SWITCH WILL RESULT IN A PROGRAM WAIT LOOP FOR APROX. 500 MS WHEN IN A SCOPE LOOP DUE TO SWR0=1, SWR1=1, OR WHEN SWR5=1. IN SOME CASES, THIS MAY BE USEFUL FOR WAITING FOR THE DISK MOVEMENT TO COMPLETE IF CONTROL OR DRIVE ERRORS OCCUR, BEFORE REPEATING THE TEST AGAIN. IN SOME CASES, FAILURE TO WAIT, MAY CAUSE ADDITIONAL ERRORS.
- SWR8=1 GET ALL REGISTERS AFTER THE RECOVERABLE ERROR HALT "ERHLT9". AFTER AN ERROR HALT AT LOCATION "ERHLT9", RAISING THIS SWITCH AND PRESSING KEY CONTINUE RESULTS IN AN ERROR TYPEOUT OF THE ACTUAL CONTENTS OF THE CRC, STATUS, COMMAND, LOWER DATA, AND SURFACE AND SECTOR REGISTERS.
- SWR9=1 PROGRAM HALT OR STOP AT END OF PROGRAM PASS COMPLETION.
- SWR10=11 DISK DRIVE(S) TO TEST. IN MULTI-DRIVE TESTING, INDICATES TO THE PROGRAM THE ACTUAL AMOUNT OF NON-EXISTING DRIVES AND THE AMOUNT OF DRIVES NUMBERED SEQUENTIALLY FROM DISK 0 TO TEST. IN SINGLE DRIVE TESTING, UPON INITIAL START OF PROGRAM, AND IF SWR3=1, INDICATES TO THE PROGRAM THE DRIVE TO TEST.

5. OPERATOR AND/OR PROGRAM ACTION
-----5.1 STANDARD TEST PROCEDURE

- A. START AS SPECIFIED THROUGH OUT THIS DOCUMENTATION IS KEY CLEAR AND THEN KEY CONTINUE ON PDP8/E, PDP8/M, AND PDP8/F COMPUTERS.
- B. LOAD THE PROGRAM INTO ANY R/W MEMORY BANK USING THE STANDARD BINARY LOADER TECHNIQUE.
- C. IF IT IS DESIRED TO CHANGE THE IOT CODES WITHIN THE PROGRAM, FOLLOW THE PROCEDURE IN SECTION 5.8.
- D. RUN THE DRIVE CONTROL TEST WITH ALL DRIVES ON THE DISK SYSTEM BY USING THE SINGLE OR MULTI DRIVE TESTING METHOD, SECTION 5.3 OR SECTION 5.4, RESPECTIVELY.
- E. THE PROGRAM EXECUTION TIME IS APROX, 30 MINUTES PER DISK DRIVE.
- F. RUN THE WRITE PROTECT CHECK TESTS ON ALL DRIVES ON THE DISK SYSTEM BY FOLLOWING THE PROCEDURES IN SECTIONS 5.5 AND 5.6.
- G. MANUAL FUNCTIONS, SECTION 5.7, MAY BE USED FOR TROUBLE SHOOTING, IF DESIRED.
- H. SEEK FROM SWITCHES, SECTION 5.9, MAY BE USED FOR TROUBLE SHOOTING, IF DESIRED.
- I. IF THE PROGRAM WAS STOPPED BY SWR4=1 OR BY "ERHLT9", ADDRESS 0205 CAN BE USED TO RESTART THE PROGRAM AT THE LAST SUBTEST EXECUTED. (NOTE: WATCH YOUR SWITCH SETTINGS.)

5.2 RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE

THE FOLLOWING IS THE CORRECT CARTRIDGE MOUNTING PROCEDURE FOR THE RK05 DISK DRIVE. ANY DEVIATION ENCOUNTERED DURING THIS PROCEDURE WILL BE CONSIDERED AS AN ERROR CONDITION.

- A, SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION.
- B, TURN AC POWER TO DISK DRIVE ON.
- C, VERIFY THAT LIGHT LABELED "PWR" IS ON.
- D, WAIT FOR LIGHT LABELED "LOAD" TO COME ON.
- E, VERIFY THAT LIGHTS LABELED "RDY", "ON CYL", "FAULT", "WT", AND "RD" ARE OFF.
- F, OPEN ACCESS DOOR.
- G, INSERT CARTRIDGE.
- H, CLOSE ACCESS DOOR.
- I, SET SWITCH LABELED "RUN/LOAD" TO THE "RUN" POSITION.
- J, WAIT FOR THE LIGHTS LABELED "RDY" AND "ON CYL" TO COME ON.
- K, TOGGLE SWITCH LABELED "WT PROT" AND VERIFY THAT THE LIGHT LABELED "WT PROT" GOES ON AND OFF.
- L, TOGGLE SWITCH LABELED "WT PROT" UNTIL THE LIGHT LABELED "WT PROT" GOES OFF.
- M, VERIFY THAT LIGHTS LABELED "FAULT", "WT", "RD", AND "LOAD" ARE OFF.

5.3 DRIVE CONTROL TEST (SINGLE DRIVE TESTING)

- A, MAKE READY THE DISK DRIVE TO BE TESTED USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 5.2.
- B, SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL DRIVES NOT BEING TESTED.
- C, VERIFY THAT AC POWER TO ALL DRIVES IS ON.

(5.3 CONT'D)

- D. SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS.
- E. SET THE SWITCH REGISTER TO 0000.
- F. SET SWR3=1 TO INDICATE "SINGLE DRIVE TESTING".
- G. SET SWR10-11 TO THE DISK DRIVE TO BE TESTED AND START THE COMPUTER RUNNING.
- H. THE PROGRAM SHOULD PRINT THE FOLLOWING MESSAGE AT THE COMPLETION OF EACH PASS.

"RK8E DRIVE CONTROL TEST PASS COMPLETE"
- I. ALWAYS USE SWR4=1 FOR STOPPING THE TEST.
- J. IF IT IS DESIRED TO HAVE THE PROGRAM HALT OR STOP AT END OF PROGRAM PASS COMPLETION SET SWR9=1.
- K. ANY HALTS OR TYPEOUTS OTHER THAN THE PASS COMPLETE TYPEOUT OR END OF TEST HALT MENTIONED ABOVE WILL BE CONSIDERED AN ERROR CONDITION. IN ALL CASES ACCESS "ERRORS" SECTION 6 IN THIS DOCUMENTATION.
- L. FOR ABSOLUTE LOCATIONS OF ALL KNOWN HALTS ACCESS PAGE 1 OF THE PROGRAM LISTING.

5.4

DRIVE CONTROL TEST (MULTI-DRIVE TESTING)

- A. MAKE READY ALL DISK DRIVES NUMBERED SEQUENTIALLY FROM DRIVE 0 TO BE TESTED USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 5.2.
- B. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL DISK DRIVES NOT BEING TESTED.

(5.4 CONT'D.)

- C. VERIFY THAT AC POWER TO ALL DRIVES IS ON.
- D. SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS.
- E. SET THE SWITCH REGISTER TO 0000.
- F. SET SWR10-11 TO THE AMOUNT OF EXTRA DISK DRIVES NUMBERED SEQUENTIALLY FROM DISK 0 TO BE TESTED AND START THE COMPUTER RUNNING.

SWR10-11=1	2 DISK SYSTEM
SWR10-11=2	3 DISK SYSTEM
SWR10-11=3	4 DISK SYSTEM

- G. THE PROGRAM SHOULD PRINT THE FOLLOWING MESSAGE AT THE COMPLETION OF EACH PASS.

"RK8E DRIVE CONTROL TEST PASS COMPLETE"

- H. ALWAYS USE SWR4=1 FOR STOPPING THE TEST.
- I. IF IT IS DESIRED TO HAVE THE PROGRAM HALT OR STOP AT THE END OF PROGRAM PASS COMPLETION SET SWR9=1.
- J. ANY HALTS OR TYPEOUTS OTHER THAN THE PASS COMPLETE TYPEOUT AND THE END OF TEST HALT MENTIONED ABOVE WILL BE CONSIDERED AN ERROR CONDITION. IN ALL CASES ACCESS "ERRORS" SECTION 6 IN THIS DOCUMENTATION.
- K. FOR ABSOLUTE LOCATIONS OF ALL KNOWN HALTS ACCESS PAGE 1 OF THE PROGRAM LISTING.

5.5 CHECK WRITE PROTECT (MANUAL)

-
- A. RUN THE REGULAR DRIVE CONTROL TEST WITH ALL DRIVES ON THE CONTROL USING THE SINGLE OR MULTI DRIVE TESTING METHOD, BEFORE RUNNING THIS "WRITE PROTECT" PORTION.
 - B. MAKE READY A DRIVE TO TEST USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 5.2.
 - C. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL OTHER DRIVES.
 - D. VERIFY THAT AC POWER TO ALL DRIVES IS ON.
 - E. VERIFY THAT THE LIGHT LABELED "WT PROT" IS "OFF" ON THE CURRENT DRIVE UNDER TEST.

(5.5 CONT'D)

- F. SET THE SWITCH REGISTER TO 0203 AND PRESS LOAD ADDRESS.
- G. SET THE SWITCH REGISTER TO 0000.
- H. SET SWR10-11 TO THE CURRENT DRIVE NUMBER UNDER TEST.
- I. PRESS START AND THE COMPUTER SHOULD HALT AT LOCATION "MPHLT1".
- J. PRESS SWITCH LABELED "WT PROT" TO TURN "WRITE PROTECT" AND THE LIGHT LABELED "WT PROT" ON.
- K. PRESS KEY CONTINUE AND THE COMPUTER SHOULD HALT AT LOCATION "MPHLT2" INDICATING A SUCCESSFUL TEST.
- L. FOR ALL KNOWN HALTS IN THIS PROGRAM, ACCESS PAGE 1 OF THE PROGRAM LISTING.
- M. IF ANY ERRORS ARE ENCOUNTERED OR IF IT IS DESIRED TO TRY THE TEST AGAIN, REPEAT STEPS A-K.
- N. FOR POSSIBLE ERROR TYPEOUTS ACCESS SECTION 6 IN THIS DOCUMENTATION. (NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST.)
- O. THE "CHECK WRITE PROTECT PROCEDURE" AS DESCRIBED ABOVE SHOULD BE RUN TWICE WITH ALL DRIVES ON THE CONTROL.

5.6

CHECK WRITE PROTECT (PROGRAM CONTROL)

- A. RUN THE REGULAR DRIVE CONTROL TEST WITH ALL DRIVES ON THE CONTROL USING THE SINGLE OR MULTI DRIVE TESTING METHOD, BEFORE RUNNING THIS "WRITE PROTECT" PORTION.
- B. MAKE READY A DRIVE TO TEST USING THE RK05 DRIVE CARTRIDGE MOUNTING PROCEDURE SECTION 5.2.
- C. SET SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON ALL OTHER DRIVES.
- D. VERIFY THAT AC POWER TO ALL DRIVES IS ON.
- E. VERIFY THAT THE LIGHT LABELED "WT PROT" IS "OFF" ON THE CURRENT DRIVE UNDER TEST.
- F. SET THE SWITCH REGISTER TO 0204 AND PRESS LOAD ADDRESS.
- G. SET THE SWITCH REGISTER TO 0000.
- H. SET SWR10-11 TO THE CURRENT DRIVE NUMBER UNDER TEST.

(5,6 CONT'D)

- I, PRESS START AND THE COMPUTER SHOULD HALT AT LOCATION "APHLT1" INDICATING A SUCCESSFUL TEST.
- J, VERIFY THAT THE WRITE PROTECT LIGHT LABELED "WT PROT" IS ON, ON THE CURRENT DRIVE.
- K, FOR ALL KNOWN HALTS IN THIS PROGRAM, ACCESS PAGE 1 OF THE PROGRAM LISTING.
- L, IF ANY ERRORS ARE ENCOUNTERED OR IF IT IS DESIRED TO TRY THE TEST AGAIN, REPEAT STEPS A-J.
- M, FOR POSSIBLE ERROR TYPEOUTS ACCESS SECTION 6 IN THIS DOCUMENTATION, (NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST.)
- N, THE "CHECK WRITE PROTECT PROCEDURE" AS DESCRIBED ABOVE SHOULD BE RUN TWICE WITH ALL DRIVES ON THE CONTROL.

5.7

MANUAL FUNCTIONS (FOR TROUBLE SHOOTING ONLY)

THE MANUAL FUNCTIONS ENABLES THE OPERATOR TO SELECT FUNCTIONS, DISK ADDRESS, AND DATA PATTERNS VIA THE SWITCH REGISTER. THIS IS NOT PART OF THE REGULAR TEST AND SHOULD ONLY BE USED FOR TROUBLE SHOOTING IF DESIRED.

- A, SET THE SWITCH REGISTER TO 0201 AND PRESS LOAD ADDRESS.
- B, SET THE SWITCH REGISTER TO THE DESIRED FUNCTION TO BE LOADED INTO THE COMMAND REGISTER, (SEE SECTION 8.) (NOTE: THE EXTENDED MEMORY BITS 6-8, THE ENABLE INTERRUPT BIT 3, AND THE ENABLE SET DONE BIT ON SEEK COMPLETE BIT 4, ARE NOT RECOGNIZED. THIS MANUAL PORTION IS ONLY FLAG DRIVEN AND ALL DATA TRANSFERS ARE TO THE CURRENT FIELD.)
- C, PRESS START AND THE COMPUTER SHOULD HALT.
- D, SET THE SWITCH REGISTER TO THE DESIRED DISK ADDRESS TO BE LOADED INTO THE CYLINDER, SURFACE, AND SECTOR REGISTER, (SEE SECTION 8.)
- E, PRESS START AND THE COMPUTER SHOULD HALT.
- F, SET THE SWITCH REGISTER TO THE COMPLEMENT TYPE DATA PATTERN TO BE WRITTEN ON OR READ FROM THE DISK DEPENDING ON THE FUNCTION PREVIOUSLY LOADED INTO THE COMMAND REGISTER, (NOTE: A SETTING OF 0000 WILL RESULTS IN A COMPLEMENT DATA PATTERN OF 0000 + 7777, A SETTING OF 2525 WILL RESULT IN A COMPLEMENT DATA PATTERN OF 2525 + 5252.)
- G, PRESS START AND THE COMPUTER SHOULD HALT.

(5.7 CONT'D)

- H, SET THE SWITCH REGISTER TO 0000, PRESS START, AND THE FUNCTION SELECTED WILL BE EXECUTED.
- I, IF POSSIBLE, ALWAYS USE SWR4=1 FOR STOPPING PROGRAM.
- J, IN CASE OF ERRORS OR DESIRED LOOPS, USE THE REGULAR SWITCH REGISTER SETTINGS (SECTION 4.)
- K, IF A WRITE ALL OR THE WRITE DATA FUNCTION WAS SELECTED, THE DATA PATTERN SELECTED WILL BE WRITTEN ON THE DISK ADDRESS SELECTED.
- L, IF A READ ALL OR READ DATA FUNCTION WAS SELECTED, THE DATA WILL BE READ OFF THE DISK ADDRESS SELECTED AND COMPARED AGAINST THE DATA PATTERN SELECTED.
- M, IF A SEEK ONLY FUNCTION WAS SELECTED, A SEEK ONLY WILL BE EXECUTED TO THE DISK ADDRESS SELECTED.
- N, IF A WRITE LOCK FUNCTION WAS THE SELECTED THE DISK DRIVE SELECTED WILL BE WRITE LOCKED.

5.8 CHANGE PROGRAM DEVICE IOT CODES

 THE PROGRAM NORMALLY RECOGNIZES DEVICE IOT CODE X74X. TO CHANGE THE DEVICE IOT CODES WITHIN THE PROGRAM:

- A, SET THE SWITCH REGISTER TO 0202 AND PRESS LOAD ADDRESS.
- B, SET THE SWITCH REGISTER TO 0000, SET SWITCH REGISTER BITS 3-8 TO THE DESIRED DEVICE IOT CODE, AND PRESS START.
- C, THE PROGRAM WILL CHANGE THE DEVICE IOT CODES WITHIN THE PROGRAM AND THEN HALT.
- D, THE REGULAR TESTS CAN THEN BE RUN (SEE SECTIONS 5.3, 5.4, 5.5, OR 5.6).

5.9 SEEK FROM SWITCHES (FOR RK05 ALIGNMENT)

 THE FOLLOWING SUBTEST WAS REQUESTED BY FIELD SERVICE TO AID IN RK05 ALIGNMENT. THE PROGRAM WILL SEEK ONLY BETWEEN ADDRESSES FROM SWITCH REGISTER.

- A, SET THE SWITCH REGISTER TO 4000 AND PRESS LOAD ADDRESS.
- B, SET THE SWITCH REGISTER TO 0000.
- C, SET SWR9-11 TO THE DRIVE NUMBER AND EXTENDED CYLINDER BIT OF THE FIRST SEEK ADDRESS (BITS 9-10 TO DRIVE NUMBER AND BIT 11 TO EXTENDED CYLINDER).

(5.9 CONT'D)

- D. SET SWR0-7 TO THE REMAINDER OF THE CYLINDER BITS AND THE SURFACE OF THE FIRST SEEK ADDRESS.
- E. PRESS START AND THE COMPUTER SHOULD HALT.
- F. SET THE SWITCH REGISTER TO 0000.
- G. SET SWR9-11 TO THE DRIVE NUMBER AND EXTENDED CYLINDER BIT OF THE SECOND SEEK ADDRESS (BITS 9-10 TO THE DRIVE NUMBER AND BIT 11 TO THE EXTENDED CYLINDER).
- H. SET SWR0-7 TO THE CYLINDER BITS AND SURFACE OF THE SECOND SEEK ADDRESS.
- I. PRESS START AND THE DRIVE SHOULD SEEK BETWEEN THE ADDRESSES SPECIFIED BY THE SWITCH REGISTER.
- J. THE SECOND SEEK ADDRESS CAN BE CHANGED AT ANY TIME BY SIMPLY CHANGING THE SWITCH REGISTER TO SELECT A NEW ADDRESS.
- K. CARE SHOULD BE TAKEN TO NOT SELECT A NON-EXISTENT DISK DRIVE OR NON-EXISTENT CYLINDER.
- L. NO ERROR CHECKING IS DONE DURING THIS SUBTEST.
- M. IT IS POSSIBLE TO SEEK TO A CONSTANT ADDRESS BY MAKING THE FIRST AND SECOND ADDRESS EQUAL.

6. ERRORS

6.1 USEFUL ERROR INFORMATION

IN THE REGULAR TEST, THE DISK SKIP IOT IS FIRST CHECKED AND TIMED-OUT USING AN "ISZ" TIME LOOP. IF THE SKIP IOT FAILS, AN ERROR TYPEOUT AND ERROR HALT SHOULD OCCUR. ONCE PROVEN TO WORK, THE IOT IS NOT TIMED-OUT, THE PROGRAM MAY HANG-UP IF THE SKIP IOT FAILS INTERMITTENTLY. (NOTE! THE MANUAL FUNCTIONS, SECTION 5.7, ALWAYS TIMES OUT THE SKIP IOT TO PREVENT HANGING UP.

ALL ERRORS FOUND WHEN RUNNING THIS TEST SHOULD BE CORRECTED BEFORE PROCEEDING ON IN THE TEST.

(6,1 CONT'D)

WHEN AN OPERATOR ENCOUNTERS AN ERROR WHEN RUNNING THIS TEST HE SHOULD, IN ALL CASES, READ THE ERROR TYPEOUT INFORMATION, NOTE THE LOCATION OF THE FAILURE, READ ALL THE INFORMATION UNDER ERRORS IN THIS DOCUMENTATION, AND THEN ACCESS THE PROGRAM LISTING FOR FURTHER INFORMATION.

THE ABSOLUTE LOCATION OF ALL KNOWN HALTS CAN BE FOUND ON PAGE 1 OF THE PROGRAM.

A COMPLEMENT TYPE DATA PATTERN (I.E. 2525 + 5252, 5252 + 2525, OR 0000 + 7777) IS ALWAYS USED IN THIS TEST WHEN DATA IS WRITTEN AND THEN CHECKED. IN SOME CASES, ALL 0'S IS USED IN CHECKING CRC AND STATUS REGISTERS, HOWEVER, THE DATA IS NOT CHECKED.

THE PROGRAM USES THE SAME PROGRAM BUFFER FOR WRITING AND READING DATA. THE BUFFER IS SETUP BEFORE A WRITE FUNCTION AND CLEARED BEFORE THE DATA IS READ AND CHECKED. THE BUFFER OCCUPIES THE CURRENT FIELD FROM THE END OF THE PROGRAM +400 LOCATIONS.

BEFORE DATA IS WRITTEN ON THE DISK, THE FIRST TWO WORDS OF THE BUFFER ARE SET TO THE ABSOLUTE DISK ADDRESS, THE FIRST WORD OF THE BUFFER (BITS 9-11) IS SET TO THE DRIVE NUMBER AND THE EXTENDED CYLINDER BIT, THE SECOND WORD TO THE 12 REMAINDER CYLINDER, SURFACE, AND SECTOR BITS, ALSO THE BUFFER +1 IS SET TO THE DATA WORD OF "1234". AFTER THE WRITE THEN READ, THE WORDS ARE CHECKED FOR CORRECT VALUES, INDICATING THAT THE INFORMATION WAS WRITTEN ON AND READ FROM THE SAME PLACE ON THE DISK AND THAT THE DATA BREAK STOPPED CORRECTLY. WHEN AN ERROR EXISTS WITH THE WORDS AS STATED PREVIOUS, THE OPERATOR SHOULD REALIZE THAT THE PROBLEM IS MOST LIKELY ADDRESSING AND SOMETIMES DATA ERRORS.

WHEN DATA IS BEING READ OFF THE DISK AND A CRC ERROR OCCURES THE PROGRAM WILL THEN CHECK THE DATA READ FOR DATA ERRORS. IF NO DATA ERRORS EXIST THE CRC ERROR FOUND WILL BE REPORTED AS A STATUS REGISTER ERROR. IF DATA ERRORS ARE FOUND THE DATA ERRORS WILL BE REPORTED AS DISK DATA ERRORS AND THE CRC STATUS ERROR INDICATED IN THE "STI". (SEE SECTION 6.4 FOR ERROR HEADERS AND TYPEOUTS).

THE ABSOLUTE ADDRESS LOCATIONS OF THE DATA BUFFER CAN BE FOUND ON PAGE 1 OF THE PROGRAM LISTING.

6.2 NON-RECOVERABLE ERROR HALTS

NON-RECOVERABLE ERROR HALTS FOR WHICH THERE ARE NO
TYPEOUTS OR SCOPE LOOPS ARE LISTED AND DEFINED AS FOLLOWS.

ERHLT1	UNDEFINED INTERRUPT
ERHLT2	SKIP TRAP FOR IOT "DCLR"
ERHLT3	SKIP TRAP FOR IOT "DLAG"
ERHLT4	SKIP TRAP FOR IOT "DLCA"
ERHLT5	SKIP TRAP FOR IOT "DRST"
ERHLT6	SKIP TRAP FOR IOT "DLDC"
ERHLT7	SKIP TRAP FOR IOT "DMAN"

6.3 RECOVERABLE ERROR HALT

ALL RECOVERABLE ERRORS, FOR WHICH THERE ARE SCOPE LOOPS
AND ERROR TYPEOUTS, SHOULD RESULT IN AN ERROR HALT AT
LOCATION "ERHLT9".

ERHLT9	RECOVERABLE ERROR HALT, READ INFORMATION TYPEOUT ON TTY AND ACCESS PROGRAM LISTING AND DOCUMENTATION.
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6.4 ERROR TYPEOUTS

WHEN A RECOVERABLE ERROR OCCURES THE PROGRAM WILL
PRINT AN "ERROR HEADER" WHICH WILL SPECIFY THE
PARTICULAR REGISTER OR TYPE OF ERROR FOUND
AT THE TIME OF THE FAILURE.

POSSIBLE "ERROR HEADERS" ARE AS FOLLOWS.

STATUS REGISTER ERROR
COMMAND REGISTER ERROR
DISK ADDRESS REGISTER ERROR
DISK DATA ERROR
CRC REGISTER ERROR
DATA REGISTER ERROR
DISK SKIP ERROR
DISK INTERRUPT ERROR

AFTER THE "ERROR HEADER" MENTIONED ABOVE IS TYPED, THE PROGRAM WILL PRINT THE FOLLOWING ERROR INFORMATION FOUND AT THE TIME OF THE FAILURE, PERTAINING TO THE FAILURE. POSSIBLE TYPEOUTS ARE AS FOLLOWS.

PCI PROGRAM LOCATION OF THE ACTUAL FAILURE.
GDI REFERS TO THE DATA EXPECTED IN THE REGISTER OR TYPE OF TEST SPECIFIED IN THE "ERROR HEADER".
CRI CONTENTS OF THE CRC REGISTER.
STI CONTENTS OF THE STATUS REGISTER.
DBI CONTENTS OF THE LOWER DATA REGISTER.
CMI CONTENTS OF THE COMMAND REGISTER.
DAI CONTENTS OF THE DISK ADDRESS REGISTER OR THE CYLINDER, SURFACE, AND SECTOR BITS.
CAI CONTENTS OF THE INITIAL CURRENT ADDRESS
ADI BREAK ADDRESS OF DATA BREAK IN COMPUTER.
DTI DATA FOUND DURING DATA BREAK.

THE "GDI" INFORMATION TYPED OUT POINTS TO THE DATA EXPECTED IN THE REGISTER OR TYPE OF ERROR TYPED OUT IN THE "ERROR HEADER".

THE ERROR INFORMATION INDICATOR SUGGESTED BY THE "ERROR HEADER" (I.E. DA: FOR DISK ADDRESS ERROR, CM: FOR COMMAND REGISTER ERROR, CR: FOR CRC REGISTER ERROR, ETC.), IS THE ACTUAL CONTENTS OF THAT PARTICULAR REGISTER. ERROR INFORMATION OTHER THAN THAT SUGGESTED BY THE ERROR HEADER IS THE SOFTWARE VALUE LOADED INTO THAT REGISTER PRIOR TO THE FAILURE.

TO TYPE THE ACTUAL CONTENTS OF THE REGISTERS, SET SWR8=1 AFTER AN ERROR HALT AT LOCATION "ERHLT9", AND PRESS KEY CONTINUE, THE CONTENTS OF THE CRC, STATUS, LOWER DATA, COMMAND, AND SURFACE AND SECTOR REGISTERS WILL THEN BE TYPED.

6.5 SCOPE LOOPS

 THERE ARE SCOPE LOOPS AVAILABLE FOR ALL ERRORS RESULTING IN AN ERROR HALT AT LOCATION "ERHLT9".

TO ENTER SCOPE LOOP, INHIBIT ERROR TYPEOUT, AND INHIBIT ERROR HALT, AFTER AN ERROR HALT AT "ERHLT9", SET SWR0=1 TO INDICATE SCOPE LOOP AND PRESS KEY CONTINUE.

IF THE SCOPE LOOP IS WORKING CORRECTLY AND THE TEST IS STILL FAILING, THE TTY BELL SHOULD RING INDICATING AN ERROR, THEN SET SWR2=1 TO INHIBIT THE TTY ERROR BELL.

SWR1=1 MAY HAVE TO BE USED IN SCOPE LOOPS IN CONJUNCTION WITH SWR0=1, IF THE CURRENT TEST IS WORKING INTERMITTENTLY.

6.6 TYPICAL ERROR TYPEOUTS

 THE FOLLOWING IS AN EXAMPLE OF AN "ERROR HEADER" AND TYPEOUT THAT COULD HAVE OCCURRED IF THE DISK SKIP IOT FAILED TO SKIP.

DISK SKIP ERROR
 PCI0267

THE FOLLOWING IS AN EXAMPLE OF AN "ERROR HEADER" AND ERROR TYPEOUT THAT COULD HAVE OCCURRED ON A DATA BREAK ERROR, (NOTE CRC IN THE STATUS INDICATOR "ST:")

DISK DATA ERROR
 PCI1161 GD:5252 ST:4010 CM:1000 DA:0001 CA:7000 AD:7010 DT:5250

THE FOLLOWING IS A TYPICAL ERROR THAT COULD HAVE OCCURED WHILE READING THE CRC REGISTER.

CRC REGISTER ERROR
 PCI2246 GD:116047 CR:116046 CM:1000 DA:7777

THE FOLLOWING IS AN EXAMPLE OF AN ERROR TYPEOUT THAT COULD HAVE OCCURRED IF THE STATUS REGISTER FAILED. (NOTE! IN THIS CASE THE OPERATOR INDICATED TO THE PROGRAM TO TYPE THE ACTUAL CONTENTS OF THE REGISTERS BY SETTING SWR8=1 AFTER THE ERROR HALT AT LOCATION "ERHLT9" AND PRESSING KEY CONTINUE).

STATUS REGISTER ERROR
 PCI1100 GD:4000 ST:2000 CM:5002 DA:0000
 CR:000000 ST:2000 DB:0000 CM:5002 DA:0000

7. RESTRICTIONS

ALL DISK DRIVES SHOULD BE SET TO THE LOAD POSITION THAT ARE NOT BEING TESTED.

ALL ERRORS SHOULD BE CORRECTED BEFORE PROCEEDING ON IN THE PROGRAM.

8. TROUBLE SHOOTING INFORMATION

IOT		FUNCTION
---		-----
6741	DSPK	"SKIP" SKIP IF TRANSFER DONE FLAG OR ERROR FLAG IS SET.
6742	DCLR	"CLEAR" FUNCTION IS REGULATED BY AC BITS 10 AND 11. THE AC IS THEN CLEARED.
AC10	AC11	
----	----	
0	0	CLEAR THE AC AND STATUS REGISTER.
2	1	CLEAR THE AC, CONTROL, AND MAJOR REGISTERS. THIS INSTRUCTION WILL STOP THE CONTROL EVEN IF IT IS WRITING A HEADER. THIS IS THE ONLY INSTRUCTION THAT CLEARS MAINTENANCE MODE.
1	0	CLEAR AC, RECALIBRATE DISK DRIVE, AND CLEAR STATUS REGISTER.
6743	DLAG	"LOAD DISK ADDRESS AND GO" LOAD THE DISK CYLINDER, SURFACE, AND SECTOR FROM THE AC, CLEAR THE AC, AND DO THE COMMAND IN THE COMMAND REGISTER.

(8. CONT'D)

AC
--

0=6

CYLINDER

7

SURFACE (1=UPPER) (0=LOWER)

8=11

SECTOR

6744 DLCA

"LOAD CURRENT ADDRESS" LOAD THE
CURRENT ADDRESS FROM AC. THE AC
IS THEN CLEARED.AC
--

0=11

CURRENT ADDRESS

6745 DRST

"READ STATUS" CLEAR THE AC AND
READ THE CONTENTS OF THE STATUS
REGISTER INTO THE AC.AC
--

0

TRANSFER DONE

1

READY TO SEEK, READ, OR WRITE.

2

NOT USED

3

SEEK FAIL

4

DISK FILE READY

5

CONTROL BUSY ERROR

6

TIME OUT ERROR

7

WRITE LOCK ERROR

8

CRC ERROR

9

DATA RATE ERROR

10

DRIVE STATUS ERROR

11

CYLINDER ADDRESS ERROR

6746 DLDC

"LOAD COMMAND" LOAD THE COMMAND
REGISTER FROM AC, CLEAR THE AC,
AND CLEAR THE STATUS REGISTER.

(8, CONT'D)

AC
--0=2=0
0=2=1
0=2=2
0=2=3
0=2=4
0=2=5
0=2=6
0=2=7

3

4

5

6

7

8

9

10

11

6747 DMAN

READ DATA
 READ ALL
 WRITE LOCK
 SEEK ONLY
 WRITE DATA
 WRITE ALL
 NOT USED
 NOT USED
 ENABLE INTERRUPT
 ENABLE SET TRANSFER DONE ON SEEK DONE
 HALF BLOCK 128 WORDS
 EXTENDED MEMORY ADDRESS
 EXTENDED MEMORY ADDRESS
 EXTENDED MEMORY ADDRESS
 UNIT SELECT
 UNIT SELECT
 EXTENDED CYLINDER ADDRESS

"MAINTENANCE IOT" LOAD THE
 MAINTENANCE REGISTER FROM THE AC, THE
 FUNCTION IS REGULATED BY THE AC BITS,
 MAINTENANCE MODE CAN ONLY BE CLEARED
 BY DCLR "CLEAR CONTROL".

AC
--

0

1

2

3

4

5

6

7

8

9

10

11

ENTER MAINTENANCE MODE
 ENABLE SHIFT TO LOWER BUFFER
 AC BIT 10, CRC REGISTER, AND THE
 LOWER DATA BUFFER ARE CONNECTED AS
 A SHIFT REGISTER, AC BIT 10 DATA
 SHIFTS TO THE CRC, THE CRC SHIFTS
 TO THE LOWER DATA BUFFER,
 SHIFT COMMAND REGISTER TO THE LOWER
 DATA BUFFER,
 SHIFT THE SURFACE AND SECTOR REGISTER
 TO THE LOWER DATA BUFFER,
 SHIFT AC 10 DATA TO THE UPPER
 DATA BUFFER. THE UPPER BUFFER
 SHOULD SINK IN THE SILO WHEN
 FULL.
 ONE SINGLE CYCLE BREAK REQUEST,
 DIRECTION IS REGULATED BY FUNCTION
 IN THE COMMAND REGISTER,
 CLEAR AC THEN READ THE LOWER
 DATA BUFFER TO THE AC.
 NOT USED.
 NOT USED.
 USED AS DATA WITH OTHER BITS IN
 THE MAINTENANCE MODE.
 NOT USED

9. PROGRAM DESCRIPTION

THE RK8E DRIVE CONTROL TEST VERIFIES BASIC FUNCTIONAL OPERATION OF THE RK8E CONTROL LOGIC WITH THE RK05 DISK DRIVE(S). THE PROGRAM IS COMPRISED OF MANY INDIVIDUAL SUBTESTS WHICH ARE AUTOMATICALLY RUN IN A SEQUENTIAL FLOW. ABOVE EACH SUBTEST, IN THE LISTING, IS A BRIEF DESCRIPTION OF EACH SUBTEST.

WHEN SINGLE DRIVE TESTING, ONE PASS THROUGH ALL SUBTESTS (TST0-TST45) RESULTS IN A PASS COMPLETION. WHEN MULTI-DRIVE TESTING, ONE PASS THROUGH ALL SUBTESTS(TST0-TST45) ON ALL DRIVES AND THE RUNNING OF THE OVERLAP SEEK TESTS(OVRLAP; GRONK, AND OVRRED) RESULTS IN A PASS COMPLETION.

CONSIDERING NO ERROR CONDITIONS, THE DRIVES THAT HAVE RUN THIS TEST ARE FORMATTED, IF THE PROGRAM WAS STOPPED AT END OF PROGRAM PASS COMPLETION BY SWR9=1.

10. PROGRAM LISTING

```

/
/ RKBE DRIVE CONTROL TEST
/
/ MAINDEC-0A-DHRKB-E-L
/
/ NOTE: LOCATION 0 WILL CONTAIN THE REVISION
/ LEVEL (IN ASCII) ON PROGRAM LOAD,
/
/ COPYRIGHT (C) 1972,1973,1974 DIGITAL EQUIP. CORP., MAYNARD, MASS.
/
/ ALL KNOWN HALTS
/
0200 5217 ERHLT1 /UNDEFINED INTERRUPT
0201 5343 ERHLT2 /SKIP TRAP FOR DCLR
0202 5324 ERHLT3 /SKIP TRAP FOR DLAG
0203 5316 ERHLT4 /SKIP TRAP FOR DLCA
0204 5303 ERHLT5 /SKIP TRAP FOR DRST
0205 5332 ERHLT6 /SKIP TRAP FOR DLDC
0206 5347 ERHLT7 /SKIP TRAP FOR DMAN
0207 5142 ERHLT9 /THE RECOVERABLE ERROR HALT
0210 6410 STPHLT /PROGRAM STOP OR HALT FROM SWR4=1
0211 6555 CHNHLT /IOT CHANGE HALT
0212 4122 MPHLT1 /HALT FOR "CHECK WRITE PROTECT"
0213 4162 MPHLT2 /HALT FOR "CHECK WRITE PROTECT"
0214 4776 APHLT1 /HALT FOR "CHECK WRITE PROTECT"
0215 4072 ENDHLT /END OF TEST HALT FROM SWR9=1
0216 4002 HEDHLT /FROM ALIGNMENT SUBTEST
/
/ BUFFER LOCATION INFORMATION
/
0217 7000 WRKBUF /START OF PROGRAM DATA BUFFER
0220 7377 ENDBUF /END OF PROGRAM DATA BUFFER
0221 7000 HIRK /DISK ADDRESS WORD IF BUFFER
0222 7001 LOTRK /DISK ADDRESS WORD IN BUFFER
0223 7400 STPCNK /BUFFER #1 "BREAK STOP CHECK" "1234"
/
6741 OSKP=6741 /SKIP ON TRANSFER DONE OR ERROR
6742 DCLR=6742 /CLEAR DISK CONTROL LOGIC
6743 DLAG=6743 /LOAD ADDRESS AND GO
6744 DLCA=6744 /LOAD CURRENT ADDRESS
6745 DRST=6745 /READ STATUS REGISTER
6746 DLDC=6746 /LOAD COMMAND REGISTER
6747 DMAN=6747 /LOAD MAINTENANCE
/
4420 DSKOUT=JMS I XDOUT
4421 DSKIN=JMS I XDIN
4422 RANADD=JMS I XRNAD
4424 RECAL=JMS I XRESTR
4423 SEEK=JMS I XONLY
4425 DISKGO=JMS I XDISKG
4426 HAFCHK=JMS I XHFCHK
4431 KILBUF=JMS I XKLBUF
4430 FILBUF=JMS I XFLBUF
4433 WATISZ=JMS I XWTISZ

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```

4432 SKPWAT=JMS I XSKWAT
4427 FIGURE=JMS I XFIGURE
4437 NERROR=JMS I XNERR0
4440 ERROR=JMS I XERRO
4441 IONWAT=JMS I XIONWT
4442 ACCHP1=JMS I XCOMP1
4443 ACCHP2=JMS I XCOMP2
4444 ROSTAT=JMS I XROST
4445 RDCMD=JMS I XRDCM
4446 RDADD=JMS I XRDAD
4452 LDADD=JMS I XLDAD
4447 OSKSKP=JMS I XSDKP
4450 LDCMD=JMS I XLDCM
4451 LDCUR=JMS I XLDCA
4453 CLRALL=JMS I XCLDR
4454 RDCRC=JMS I XRDCR
4455 LDMAN=JMS I XLDMN
4456 RDBUF=JMS I XRDSF
4457 PRNTER=JMS I XPRN
4462 OCTEL=JMS I XFROCT
4461 TWOCT=JMS I XTOCT
4436 TYPE=JMS I XPRINT
4462 CRLF=JMS I XCRLF
/
/
0000 0305 / *2
0001 5001 /
0002 0002 /
0003 0003 /
/
0010 0000 / *10
/
0010 0000 AUT010, 0
/
0011 0010 K0010, 0010
0012 0020 K0020, 0020
0013 0040 K0040, 0040
0014 0100 K0100, 0100
0015 0200 K0200, 0200
0016 0400 K0400, 0400
0017 1000 K1000, 1000
/
0020 0020 / *20
/
0020 5553 XDOUT, DOUT
0021 4536 XDIN, DIN
0022 6320 XRNAD, RNAD
0023 6215 XONLY, ONLY
0024 6202 XRESTR, RESTOR
0025 5600 XDISKG, DISKG
0026 6432 XHFCHK, HFCHK
0027 5656 XFIGURE, FIGURE
0030 5447 XFLBUF, FLBUF
0031 5435 XKLBUF, KLBUF
/REVISION "E"

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0032 5261 XSKWAT, SKWAT
0033 5247 XWTISZ, WTISZ
0034 5215 INTR0, INTADD
0035 0222 THSFLD, PRSFLD
0036 6151 XPRINT, PRINT
0037 6400 XNERR0, NERR0
0040 5000 XERR0, ERRO
0041 5200 XIONWT, IONWT
0042 5221 XCOMP1, COMP1
0043 5231 XCOMP2, COMP2
0044 5300 XROST, RDST
0045 5412 XRDCM, RDCM
0046 5350 XROAD, ROAD
0047 5333 XSDKP, SDKP
0050 5325 XLDCM, LDCM
0051 5307 XLOCA, LDCA
0052 5317 XLOAD, LDAD
0053 5340 XCCLR, CLDR
0054 6000 XROCR, ROCR
0055 5344 XLDMN, LDMN
0056 5400 XROBF, ROBF
0057 6111 XPRN, PRN
0060 6066 XFROCT, FROCT
0061 6036 XTOCT, TOCT
0062 6053 XCRLF, UPONE
0063 7001 XLOTRK, LOTRK
0064 7000 XHITRK, HITRK
0065 4500 CYL450, 4500
0066 4520 TRK212, 4520
0067 7000 BGNBUF, WRKBUF
0070 0000 DRIVNO, 0
0071 0000 DRIVSV, 0
0072 0001 K2001, 0001
0073 0002 K2002, 0002
0074 0003 K2003, 0003
0075 0004 K2004, 0004
0076 0005 K2005, 0005
0077 0006 K2006, 0006
0100 0007 K2007, 0007
0101 1234 K1234, 1234
0102 2000 K2000, 2000
0103 3000 K3000, 3000
0104 4000 K4000, 4000
0105 6000 K6000, 6000
0106 7000 K7000, 7000
0107 7760 K7760, 7760
0110 7700 K7700, 7700
0111 0077 K0077, 0077
0112 2525 K2525, 2525
0113 5252 K5252, 5252
0114 5000 K5000, 5000
0115 7771 K7771, 7771
0116 0017 K0017, 0017
0117 0037 K0037, 0037
0120 6201 K0CF, CDF

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0121 6244 KRMF, RMF
0122 7740 K7740, 7740
0123 7400 K7400, 7400
0124 7600 K7600, 7600
0125 5403 K5403, 5403
0126 0770 K0770, 0770
0127 7007 K7007, 7007
/
DECIMAL
/
0130 7764 H12, -12
/
OCTAL
/
0131 7774 H4, -4
0132 0000 REG0, 0
0133 0000 REG1, 0
0134 0000 SBCNT1, 0
0135 0000 TCNTR1, 0
0136 0000 TCNTR2, 0
0137 0000 TCNTR3, 0
0140 0000 TCNTR4, 0
0141 0000 TCNTR5, 0
0142 0000 TCNTR6, 0
/
0143 0000 GDREG1, 0
0144 0000 GDREG2, 0
0145 0000 CRREG1, 0
0146 0000 CRREG2, 0
0147 0000 STREG, 0
0150 0000 DBREG, 0
0151 0000 CMREG, 0
0152 0000 DAREG, 0
0153 0000 CAREG, 0
0154 0000 ADREG, 0
0155 0000 DTREG, 0
0156 0000 ACREG, 0
0157 0000 HOMEMA, 0
0160 0000 RAPCNT, 0
0161 2200 STCON, 2200
0162 0011 CRWRD1, 0011
0163 6047 CRWRD2, 6047
0164 0000 DATCNT, 0
0165 0000 SAVDAT, 0
0166 0306 K0306, 0306
0167 5373 K5373, 5373
0170 5300 K5300, 5300
0171 6304 K6304, 6304
0172 3240 ENDTRK, 3240
0173 7777 SOFERR, 7777
0174 0000 SAVPCT, 0
0175 0200 RESTRT, 0200
0176 5617 KTIME, 5617
/
0200 *200

```

```

/
0200 5206 / BGN, JMP ,+6 /TO NORMAL TEST
0201 5777' JMP MANUAL /TO MANUAL TEST
0202 5776' JMP CHANG /TO CHANGE IOT DEVICE CODES
0203 5775' JMP MANPRO /CHECK MANUAL WRITE PROTECT
0204 5774' JMP AUTPRO /CHECK PROGRAM WRITE PROTECT
0205 5575 JMP I RESTRT /RESTART AFTER PROGRAM STOP1
0206 6224 RIF
0207 3157 DCA HOMEMA
0210 1157 TAD HOMEMA
0211 1122 TAD KCDF /MAKE HOMEDF
0212 3222 DCA PRSFLD
0213 1121 TAD KRMF /GET RMF FOR INT, RETURN
0214 6201 CDF 0 /SWITCH FIELD 0
0215 3472 DCA I K0001
0216 1125 TAD K5403 /JMP I 3 FOR LOC. 2
0217 3473 DCA I K0002
0220 1034 TAD INTRO /GET ADDRESS RETURN
0221 3474 DCA I K0003
0222 7402 PRSFLD, HLT /MAKE DF=IF
0223 7604 LAS
0224 0074 AND K0003 /MASK AMOUNT OF DRIVES
0225 3071 DCA DRIVSV
/
0226 7604 LAS
0227 0016 AND K0400 /MASK 0MRS
0230 7640 SEA CLA /TEST DISK IN 10-11
0231 1071 TAD DRIVSV /YES, GET DISK NO. TO TEST
0232 7104 CLL RAL /MAKE IT IN 9-10
0233 3070 DCA DRIVNO /START WITH THIS DRIVE X
0234 3132 DCA REG0
/
/STATUS AND SELECT TEST
/
/VERIFY THAT THE DISK DRIVE IN "DRIVNO" IS
/READY TO SEEK, READ, OR WRITE, STATUS REGISTER
/SHOULD GO TO 4000.
/
0235 7330 TST0, CLA CLL CML RAR /EXPECTED STATUS
0236 3144 OCA G0REG2 /SETUP COMPARE REGISTER
0237 1015 TAD K0200 /ENABLE SET DONE BIT
0240 1070 TAD DRIVNO /GET CURRENT DRIVE NUMBER
0241 4450 LDCMD /LOAD COMMAND REGISTER
0242 4444 RDSTAT /READ STATUS
0243 4442 ACCMP1 /CHECK RESULTS
0244 7610 SKP CLA /O.K, 80 FAR
0245 5253 JMP T0E /ERROR STATUS
0246 3144 DCA G0REG2 /SETUP COMPARE REGISTER
0247 4453 CLRALL /CLEAR STATUS
0250 4444 RDSTAT /READ STATUS
0251 7650 SNA CLA /SHOULD BE 0000
0252 4437 NERROR /O.K, 4096 LOOPS
0253 4440 T2E, ERROR /ERROR, STATUS
0254 0235 TST0 /SCOPE LOOP POINTER
0255 5200 5200 /TEXT POINTER

```

```

/
/SKIP (DSKP) TEST
/
/VERIFY THAT "OSKP" SKIPS ON TRANSFER DONE FLAG
/WHEN THE DISK DRIVE IS READY.
/
0256 1015 TST1, TAD K0200 /ENABLE SET DONE BIT
0257 1070 TAD DRIVNO /CURRENT DRIVE
0260 4450 LDCMD /LOAD COMMAND
0261 4447 DSKSKP /DSKP "DISK SKIP IOT"
0262 5266 JMP T1E /ERROR, NO SKIP
0263 4453 CLRALL /CLEAR SKIP FLAG OUT
0264 4447 DSKSKP /DSKP "DISK SKIP IOT"
0265 4437 NERROR /O.K, 4096 LOOPS
0266 4440 T1E, ERROR /ERROR, DSKP FAILED
0267 0256 TST1 /SCOPE LOOP POINTER
0270 0006 0006 /TEXT POINTER
/
/INTERRUPT TEST
/
/VERIFY THAT INT, OCCURES FROM
/THE TRANSFER DONE FLAG WHEN DISK
/DRIVE UNDER TEST IS READY TO SEEK,
/READ, OR WRITE.
/
0271 1015 TST2, TAD K0200 /ENABLE SET DONE BIT
0272 1016 TAD K0400 /ENABLE DISK INT.
0273 1070 TAD DRIVNO /GET CURRENT DRIVE
0274 4450 LDCMD /LOAD COMMAND REGISTER
0275 7240 CLA CMA /SOFTWARE FLAG
0276 4441 IONWAT /WAIT FOR DISK INTERRUPT
0277 5313 JMP T2E /ERROR, NO INT.
0300 4453 CLRALL /CLEAR THE INT, OUT
0301 7240 CLA CMA /SOFTWARE FLAG
0302 4441 IONWAT /WAIT FOR DISK INTERRUPT
0303 7610 SKP CLA /O.K, NO INT.
0304 5313 JMP T2E /ERROR, INT.
0305 1015 TAD K0200 /ENABLE SET DONE BIT
0306 1070 TAD DRIVNO /CURRENT DRIVE
0307 4450 LDCMD /LOAD COMMAND
0310 7340 CLA CLL CMA /SOFTWARE FLAG
0311 4441 IONWAT /WAIT FOR DISK INTERRUPT
0312 4437 NERROR /O.K, 4096 LOOPS
0313 4440 T2E, ERROR /ERROR, DISK INT.
0314 0271 TST2 /SCOPE LOOP POINTER
0315 0007 0007 /TEXT POINTER
/
/FORCE TIMING ERROR
/
/VERIFY A "TIMING ERROR" DOES OCCUR IN STATUS REGISTER
/IF A FLAG IS ISSUED WITH THE COMMAND REGISTER IS SET TO
/A FUNCTION OF "7".
/
0316 2132 ISZ REG0
0317 1106 TST3, TAD K7000

```

```

0320 1157 TAD HOMEHA
0321 1070 TAD DRIVNO /GET CURRENT DRIVE
0322 445F LD CMD /LOAD COMMAND REGISTER
0323 1077 TAD K0006
0324 3350 DCA T3T /SETUP TEXT POINTER
0325 4452 LDADD /DLAG, LOAD DISK ADDRESS
0326 4432 SKPWAT /WAIT FOR ERROR SKIP
0327 5346 JMP T3E /ERROR, NO SKIP OCCURRED
0330 1170 TAD K5300
0331 3350 DCA T3T /SETUP TEXT POINTER
0332 7330 CLA CLL CML RAR
0333 1013 TAD K0040
0334 3144 DCA GDREG2 /SETUP EXPECTED STATUS
0335 4444 RDSTAT /READ STATUS REGISTER
0336 4442 ACCMP1 /CHECK RESULTS
0337 7610 SKP CLA /STATUS IS O.K.
0340 5346 JMP T3E /ERROR STATUS INCORRECT
0341 4453 CLRALL /CLEAR STATUS
0342 3144 DCA GDREG2 /SETUP EXPECTED STATUS
0343 4444 RDSTAT /READ STATUS
0344 4442 ACCMP1 /CHECK RESULTS
0345 4437 NERROR /ALL IS O.K.
0346 4440 T3E, ERROR /ERROR, TIMING SKIP OR STATUS
0347 0317 TST3 /SCOPE LOOP POINTER
0350 0006 T3T, 0006 /TEXT POINTER
/
/RESTORE TEST
/
/VERIFY THAT "RECALIBRATE" SETS TRANSFER
/DONE THEN DRIVE READY ON SELECTED DRIVE.
/
0351 4424 TST4, RECAL /"RECALIBRATE"
0352 0357 T4T /TEXT POINTER
0353 5355 JMP T4E /ERROR, SKIP OR STATUS
0354 4437 NERROR /O.K. TO NEXT TEST
0355 4440 T4E, ERROR /ERROR, DISK SKIP OR STATUS
0356 0351 TST4 /SCOPE LOOP POINTER
0357 0006 T4T, 0006 /TEXT POINTER
/
/HEAD MOTION AND STATUS TEST
/
/VERIFY THAT "SEEK ONLY" TRACK 312 SETS
/TRANSFER DONE THEN DRIVE IS READY.
/
0360 7301 TST5, CLA CLL IAC /EXTENDED
0361 3151 DCA CHREG /SETUP EXTENDED BIT
0362 1066 TAD TRK212 /GET LOWER DISK ADDRESS
0363 4423 SEEK /SEEK ONLY 312
0364 0371 T5T /TEXT POINTER
0365 5367 JMP T5E /ERROR, SKIP OR STATUS
0366 4437 NERROR /O.K. TO NEXT TEST
0367 4440 T5E, ERROR /ERROR, DISK SKIP OR STATUS
0370 0360 TST5 /SCOPE LOOP POINTER
0371 0006 T5T, 0006 /TEXT POINTER
/

```

```

0372 5773 JMP I ,+1 /TO NEXT TEST
0373 0400 TST6
/
0374 4710
0375 4101
0376 0535
0377 4600
0400 0400 PAGE
/
/VERIFY RESTORE CLEARS ADDRESS BITS
/
/SOMETHING IS WORKING, NOW SEEK ONLY TRACK 312
/THEN RECALIBRATE AND CHECK FOR NO ERRORS IN STATUS.
/
0400 7301 TST6, CLA CLL IAC /SETUP EXTENDED BIT
0401 3151 DCA CHREG /SETUP EXTENDED BIT
0402 1066 TAD TRK212 /GET LOWER DISK ADDRESS
0403 4423 SEEK /SEEK ONLY 312
0404 0414 T6T /TEXT POINTER
0405 5212 JMP T6E /ERROR, SKIP OR STATUS
0406 4424 RECAL /"RECALIBRATE"
0407 0414 T6T /TEXT POINTER
0410 5212 JMP T6E /ERROR, SKIP OR STATUS
0411 4437 NERROR /O.K. TO NEXT TEST
0412 4440 T6E, ERROR /ERROR, STATUS
0413 0400 TST6 /SCOPE LOOP POINTER
0414 5300 T6T, 5300 /TEXT POINTER
/
/VERIFY RESTORE CLEARS ADDRESS BITS,
/
/VERIFY A "RECALIBRATE" FROM CYLINDER,
/SURFACE, AND SECTOR 07777.
/
0415 3151 TST7, DCA CHREG /CLEAR EXTENDED BIT
0416 7340 CLA CLL CMA
0417 4423 SEEK /SEEK ONLY
0420 0430 T7T /TEXT POINTER
0421 5226 JMP T7E /ERROR, SEEK ONLY
0422 4424 RECAL /"RECALIBRATE"
0423 0430 T7T /TEXT POINTER
0424 5226 JMP T7E /ERROR, SKIP OR STATUS
0425 4437 NERROR /O.K. TO NEXT TEST
0426 4440 T7E, ERROR /ERROR, STATUS
0427 0415 TST7 /SCOPE LOOP POINTER
0430 5300 T7T, 5300 /TEXT POINTER
/
/FIND AND SELECT ALL ADDRESSES
/
/VERIFY A SEEK ONLY AND FIND ALL ADDRESSES
/INCREMENTAL SEEK TEST, SEEK 0, 1, 2, 3, ETC.
/CHECK TIMING AND NO ERRORS IN STATUS.
/
0431 3135 TST8, DCA TCNTR1
0432 3136 DCA TCNTR2

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```

0433 1135 T8R, TAD TCNTR1
0434 3151 DCA CMREG /SETUP EXTENDED BIT
0435 1136 TAD TCNTR2 /LOWER DISK ADDRESS BITS
0436 4423 SEEK /SEQUENTIAL SEEK ONLY
0437 0456 TBT /TEXT POINTER
0440 5254 JMP T8E /ERROR, SKIP OR STATUS
0441 2136 ISZ TCNTR2 /UPDATE POINTER
0442 7612 SKP CLA
0443 2135 ISZ TCNTR1 /SET EXTENDED BIT
0444 1135 TAD TCNTR1
0445 7650 SNA CLA /IS EXTENDED BIT SET YET
0446 5233 JMP T8R /NO, CONTINUE
0447 1136 TAD TCNTR2 /YES
0450 1172 TAD ENDTRK
0451 7640 SZA CLA /HAS IT LAST TRACK
0452 5233 JMP T8R /NO, CONTINUE
0453 4437 NERROR /O.K, TO NEXT TEST
0454 4440 T8E, ERROR /ERROR, STATUS
0455 0431 T8T, TST8 /SCOPE LOOP POINTER
0456 5300 T8T, 5300 /TEXT POINTER
/
/FIND AND SELECT ALL ADDRESSES
/
/VERIFY A SEEK ONLY AND FIND ALL ADDRESSES
/312, 311, 310, 307, ETC, CHECK FOR
/NO ERRORS IN STATUS REGISTER.
/
0457 1066 TST9, TAD TRK212
0460 1116 TAD K0017
0461 3135 DCA TCNTR1 /SETUP LOWER DISK ADDRESS POINT
0462 7301 CLA CLL IAC /SETUP EXTENDED POINTER
0463 3136 DCA TCNTR2
0464 1136 T9R, TAD TCNTR2 /SETUP EXTENDED BIT
0465 3151 DCA CMREG /SETUP EXTENDED BIT
0466 1135 TAD TCNTR1
0467 4423 SEEK /DECREMENTAL SEEK ONLY
0470 0511 T9T /TEXT POINTER
0471 5307 JMP T9E /ERROR, SKIP OR STATUS
0472 7340 CLA CLL CMA
0473 1135 TAD TCNTR1
0474 3135 DCA TCNTR1 /DECREMENT
0475 7301 CLA CLL IAC
0476 1135 TAD TCNTR1
0477 7640 SZA CLA /FIRST TIME 0 YET
0500 5264 JMP T9R /NO, CONTINUE
0501 1136 TAD TCNTR2
0502 7650 SNA CLA /PAST EXTENDED BIT
0503 5306 JMP T90K /YES, TEST O.K.
0504 3136 DCA TCNTR2 /CLEAR EXTENDED BIT
0505 5264 JMP T9R /CONTINUE
0506 4437 T90K, NERROR /O.K, TO NEXT TEST
0507 4440 T9E, ERROR /ERROR, SEEK ONLY
0510 0457 TST9 /SCOPE LOOP POINTER
0511 5300 T9T, 5300 /TEXT POINTER
/

```

```

/VERIFY RESTORE CLEARS ADDRESS BITS,
/
/VERIFY RECALIBRATE FROM ALL
/CYLINDERS. CHECK ALL CYLINDERS
/BETWEEN 00000-14500.
/
0512 3135 TST10, DCA TCNTR1
0513 3136 DCA TCNTR2
0514 1135 T10R, TAD TCNTR1 /GET EXTENDED BIT
0515 3151 DCA CMREG /SETUP EXTENDED BIT
0516 1136 TAD TCNTR2 /GET CYLINDER
0517 4423 SEEK /SEEK ONLY
0520 0545 T10T /TEXT POINTER
0521 5343 JMP T10E /ERROR IN SEEK ONLY
0522 4424 RECAL /"RECALIBRATE"
0523 0545 T10T /TEXT POINTER
0524 5343 JMP T10E /ERROR, SKIP OR STATUS
0525 7300 CLA CLL
0526 1136 TAD TCNTR2 /GET LAST CYLINDER
0527 1013 TAD K0040 /UPDATE
0530 3136 DCA TCNTR2
0531 7430 SEL /TIME TO SET EXTENDED?
0532 2135 ISZ TCNTR1 /YES
0533 1135 TAD TCNTR1 /GET EXTENDED POINTER
0534 7650 SNA CLA /SET?
0535 5314 JMP T10R /NO DO THIS CYLINDER
0536 1136 TAD TCNTR2 /GET LAST CYLINDER
0537 1172 TAD ENDTRK /GET LAST POINTER
0540 7640 SZA CLA /NON-EXISTENT CYLINDER?
0541 5314 JMP T10R /NO, DO IT
0542 4437 NERROR /O.K, TO NEXT TEST
0543 4440 T10E, ERROR /STATUS
0544 0512 TST10 /SCOPE LOOP POINTER
0545 5300 T10T, 5300 /TEXT POINTER
/
0546 5747 JMP I ,+1 /TO NEXT TEST
0547 0600 TST11
/
PAGE
/
/SINGLE DRIVE VIBRATION TEST!!
/
/SEEK ONLY SEEMS TO BE WORKING, NOW DO
/A FEW RANDOM SEEKS TO REALLY SHAKE THE
/DISK DRIVE UNDER TEST.
/
0600 1122 TST11, TAD K7740 /AMOUNT OF PASSES
0601 3135 DCA TCNTR1 /SETUP COUNTER
0602 4422 T11R1, RANADD /GENERATE A RANDOM ADDRESS
0603 3136 DCA TCNTR2 /SAVE IT
0604 7004 RAL /LINK IS EXTENDED BIT
0605 3137 DCA TCNTR3 /SAVE IT
0606 4422 RANADD /GENERATE A RANDOM ADDRESS
0607 3140 DCA TCNTR4 /SAVE IT
0610 7004 RAL /LINK IS EXTENDED BIT

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0611 3141          DCA   TCNTR5          /SAVE IT
0612 4422 T11R2,  RANADD          /GET A RANDOM NUMBER
0613 0111          AND   K0077          /MASK OUT
0614 1111          TAD   K7700          /MAKE COUNT VALUE
0615 3160          DCA   RAPCNT          /SETUP COUNTER
0616 1137 T11R3,  TAD   TCNTR3          /GET EXTENDED BIT
0617 3151          DCA   CMREG          /SETUP COMMAND REGISTER
0620 1136          TAD   TCNTR2
0621 4423          SEEK
0622 0641          T11T          /SEEK ONLY
0623 5237          JMP   T11E          /TEXT POINTER
0624 1141          TAD   TCNTR5          /ERROR, SKIP OR STATUS
0625 3151          DCA   CMREG          /GET EXTENDED BIT
0626 1140          TAD   TCNTR4          /SETUP COMMAND
0627 4423          SEEK
0630 0641          T11T          /SEEK ONLY
0631 5237          JMP   T11E          /TEXT POINTER
0632 2160          ISZ   RAPCNT          /ERROR, SKIP OR STATUS
0633 5216          JMP   T11R3          /UPDATE COUNTER
0634 2135          ISZ   TCNTR1          /SAME LOOP
0635 5202          JMP   T11R1          /UPDATE PASS COUNTER
0636 4437          NERROR          /MAKE NEW ADDRESS
0637 4440 T11E,  ERROR          /O.K. TO NEXT
0640 0600          TST11          /ERROR, SKIP OR STATUS
0641 0000          T11T,  0000          /SCOPE LOOP POINTER
                          /MODIFIED TEXT POINTER
/
/NOTE: THE FOLLOWING TWO (2) TESTS WILL NOT BE RUN
/IF SINGLE DRIVE TESTING OTHER THAN DRIVE 0
/OR WHEN MULTI-DRIVE TESTING WITH 4 DRIVES.
/
/SELECT ERROR TEST
/
/VERIFY A "NOT READY" ON ALL
/DRIVES NOT ON THE CONTROL.
/
0642 3132          DCA   REG0           /SETUP FOR 4096 PASSES
0643 7604          LAS
0644 0016          AND   K0400
0645 7650          SNA  CLA           /RUN NEXT TWO TESTS
0646 5252          JMP   .+4           /MAYBE
0647 1071          TAD   DRIVSV          /TEST FOR OTHER THAN 0
0650 7640          SEA  CLA           /MORE ON SYSTEM
0651 5777          JMP   TST14 -1          /YES, DON'T TEST
0652 7346          CLA  CLL  CMA  RTL          /AC TO 775
0653 1071          TAD   DRIVSV          /AMOUNT OF DRIVES
0654 7650          SNA  CLA           /ARE THERE FOUR
0655 5777          JMP   TST14 -1          /YES, CAN'T TEST
0656 7301 TST12,  CLA  CLL  IAC           /CLEAR CONTROL
0657 4453          CLRALL          /EXPECTED STATUS
0660 1161          TAD   STCON          /SETUP COMPARE
0661 3144          DCA   GDREG2
0662 7346          CLA  CLL  CMA  RTL
0663 1071          TAD   DRIVSV          /AMOUNT OF DRIVES
0664 3135          DCA   TCNTR1          /AMOUNT NOT THERE
0665 7301          CLA  CLL  IAC

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0666 1071          TAD   DRIVSV          /START WITH THIS DRIVE
0667 3136          DCA   TCNTR2
0670 1136 T12R,  TAD   TCNTR2
0671 7104          CLL  RAL          /SHIFT TO UNIT BITS
0672 1015          TAD   K0200          /ENABLE SET DONE
0673 4450          LDCMD          /LOAD COMMAND
0674 4444          RDSTAT          /READ STATUS
0675 4442          ACMP1          /CHECK RESULTS
0676 7610          SKP  CLA           /O.K.
0677 5305          JMP   T12E          /ERROR, STATUS
0700 4453          CLRALL          /CLEAR STATUS
0701 2136          ISZ   TCNTR2          /UPDATE DRIVE NO.
0702 2135          ISZ   TCNTR1          /WAS IT LAST DRIVE
0703 5270          JMP   T12R          /NO, MORE TO TEST
0704 4437          NERROR          /O.K. 4096 LOOPS
0705 4440 T12E,  ERROR          /ERROR, STATUS
0706 0656          TST12          /SCOPE LOOP POINTER
0707 5200          T12T,  5200          /TEXT POINTER
/
/SELECT ERROR TEST
/
/VERIFY A DRIVE STATUS ERROR ON ALL DRIVES
/NOT ON THE CONTROL. ACTUALLY A SELECT ERROR,
/
0710 7301 TST13,  CLA  CLL  IAC           /CLEAR CONTROL
0711 4453          CLRALL
0712 7346          CLA  CLL  CMA  RTL
0713 1071          TAD   DRIVSV          /AMOUNT OF DRIVES
0714 3135          DCA   TCNTR1          /SETUP COUNTER
0715 7301          CLA  CLL  IAC
0716 1071          TAD   DRIVSV          /START WITH THIS DRIVE
0717 3136          DCA   TCNTR2
0720 1073 T13R,  TAD   K0002
0721 1161          TAD   STCON          /EXPECTED STATUS
0722 3144          DCA   GDREG2          /SETUP COMPARE REGISTER
0723 1136          TAD   TCNTR2          /GET DRIVE NO.
0724 7104          CLL  RAL          /PUT IN UNIT BITS
0725 1015          TAD   K0200          /ENABLE SET DONE
0726 1103          TAD   K3000          /FUNCTION SEEK ONLY
0727 4450          LDCMD          /LOAD COMMAND
0730 4452          LDADD          /LOAD AND GO
0731 4444          RDSTAT          /READ STATUS
0732 4442          ACMP1          /CHECK RESULTS
0733 7610          SKP  CLA           /O.K.
0734 5356          JMP   T13E          /ERROR, STATUS
0735 4453          CLRALL          /CLEAR STATUS
0736 1161          TAD   STCON          /EXPECTED STATUS
0737 3144          DCA   GDREG2          /SETUP COMPARE
0740 4444          RDSTAT          /READ STATUS
0741 4442          ACMP1          /CHECK RESULTS
0742 7610          SKP  CLA           /O.K.
0743 5356          JMP   T13E          /ERROR, STATUS
0744 7301          CLA  CLL  IAC
0745 4453          CLRALL          /CLEAR CONTROL
0746 3144          DCA   GDREG2          /SETUP COMPARE
0747 4444          RDSTAT          /READ STATUS

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0750 764.7          SZA CLA          /STATUS SHOULD BE 0000
0751 5356          JMP T13E          /ERROR, STATUS
0752 2136          ISZ TCNTR2
0753 2135          ISZ TCNTR1
0754 532.7          JMP T13R          /TRY NEXT DRIVE
0755 4437          NERROR          /O.K., 4096 LOOPS
0756 444.0          T13E, ERROR      /ERROR, STATUS
0757 0710          TST13           /SCOPE LOOP POINTER
0760 530.7          5300           /TEXT POINTER

0761 5762          /
0762 1000          JMP I ,+1       /TO NEXT TEST
                   TST14 -1

0777 1000          /
                   PAGE
                   /
                   /SELECT ERROR TEST
                   /
                   /VERIFY THAT DISK CAPACITY EXCEEDED DOES OCCUR
                   /
1000 2132          / ISZ REG0           /SETUP FOR ONE PAS
1001 1066          TST14, TAD TRK212
1002 1012          TAD K0020
1003 3135          OCA TCNTR1          /ADDRESS POINTER
1004 7301          T14R, CLA CLL IAC          /ENABLE CLEAR CONTROL BIT
1005 4453          CLRALL          /CLEAR CONTROL
1006 7330          CLA CLL CML RAR          /EXPECTED STATUS
1007 1073          TAD K0002          /SETUP COMPARE REGISTER
1010 3144          DCA GDREG2          /EXTENDED TRACK BIT
1011 7301          CLA CLL IAC          /FUNCTION SEEK ONLY
1012 1103          TAD K3000          /CURRENT DRIVE
1013 1070          TAD DRIVNO          /LOAD COMMAND
1014 4450          LDCMD          /LOAD AND GO
1015 1135          TAD TCNTR1          /WAIT FOR SKIP
1016 4452          LDADD          /ERROR, NO SKIP
1017 4432          SKPWAT          /READ STATUS
1020 5260          JMP T14KE          /CHECK RESULTS
1021 4444          RDSTAT          /STATUS O.K.
1022 4442          ACCMP1          /ERROR, STATUS
1023 7610          SKP CLA          /ENABLE CLEAR CONTROL BIT
1024 5254          JMP T14SE          /CLEAR CONTROL
1025 7301          CLA CLL IAC          /GET LAST COMMAND
1026 4453          CLRALL          /GET ENABLE SEEK DONE BIT
1027 1151          TAD CMREG          /LOAD COMMAND
1028 1015          TAD K0200          /WAIT FOR DISK SKIP
1031 4450          LDCMD          /ERROR, SKIP
1032 4432          SKPWAT          /EXPECTED STATUS
1033 5260          JMP T14KE          /READ STATUS
1034 7330          CLA CLL CML RAR          /CHECK RESULTS
1035 3144          DCA GDREG2          /STATUS O.K.
1036 4444          RDSTAT          /ERROR, STATUS
1037 4442          ACCMP1          /CURRENT DRIVE
1040 7610          SKP CLA
1041 5254          JMP T14SE
1042 1070          TAD DRIVNO

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1043 4450          LDCMD          /LOAD COMMAND
1044 3144          DCA GDREG2          /SETUP COMPARE REGISTER
1045 4444          RDSTAT          /READ STATUS
1046 4442          ACCMP1          /CHECK RESULTS
1047 7610          SKP CLA          /STATUS O.K.
1050 5254          JMP T14SE          /ERROR
1051 2135          ISZ TCNTR1
1052 5204          JMP T14R          /LOOP
1053 4437          NERROR          /O.K., TO NEXT TEST
1054 4440          T14SE, ERROR      /ERROR, DISK CAPACITY EXCEEDED
1055 1001          TST14           /SCOPE LOOP POINTER
1056 5300          5300           /MODIFIED TEXT POINTER
1057 5263          JMP ,+4          /TO NEXT TEST
1060 4440          T14KE, ERROR      /ERROR, DISK SKIP
1061 1001          TST14           /SCOPE LOOP POINTER
1062 0006          0006           /TEXT POINTER

/STATUS TEST
/
/VERIFY THAT SKIP AND STATUS DOES OCCUR
/AFTER 256 WRITE ALL AND READ ALL BREAKS.
/THIS SHOULD WRITE ALL ZEROS ON AND
/READ ALL ZEROS OFF THE DISK SECTOR 00000.
/
1063 4431          KILBUF          /ZERO WRITE BUFFER
1064 1114          TST15, TAD K5000          /WRITE ALL FUNCTION
1065 3151          DCA CMREG          /SETUP COMMAND
1066 4425          DISK0          /DISK WRITE ALL
1067 1101          T15T          /TEXT POINTER
1070 5277          JMP T15E          /ERROR, SKIP OR STATUS
1071 1017          TAD K1000          /FUNCTION READ ALL
1072 3151          DCA CMREG          /SETUP COMMAND REGISTER
1073 4425          DISK0          /DISK READ ALL
1074 1101          T15T          /TEXT POINTER
1075 5277          JMP T15E          /ERROR, SKIP OR STATUS
1076 4437          NERROR          /O.K., TO NEXT TEST
1077 4440          T15E, ERROR      /ERROR, WRITE ALL
1100 1064          TST15           /SCOPE LOOP POINTER
1101 5300          T15T, 5300          /MODIFIED TEXT POINTER

/STATUS TEST
/
/VERIFY THAT SKIP AND STATUS DOES OCCUR AFTER
/128 WRITE ALL AND READ ALL BREAKS.
/THIS SHOULD WRITE ALL ZEROS ON AND READ ALL
/ALL ZEROS OFF THE DISK SECTOR 00000.
/
1102 1114          TST16, TAD K5000          /FUNCTION WRITE ALL
1103 1014          TAD K0100          /HALF BIT
1104 3151          DCA CMREG          /SETUP COMMAND
1105 4425          DISK0          /DISK WRITE ALL
1106 1121          T16T          /TEXT POINTER
1107 5317          JMP T16E          /ERROR, DISK SKIP OR STATUS
1110 1017          TAD K1000          /FUNCTION READ ALL
1111 1014          TAD K0100          /HALF BIT

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1112 3151          DCA  CHREG          /SETUP COMMAND
1113 4425          DISKGO          /DISK READ ALL
1114 1121          T16T          /TEXT POINTER
1115 5317          JMP  T16E          /ERROR, SKIP OR STATUS
1116 4437          NERROR          /O.K. TO NEXT TEST
1117 4440          T16E,  ERROR          /ERROR, WRITE ALL
1120 1102          TST16          /SCOPE LOOP POINTER
1121 5300          T16T,  5300          /MODIFIED TEXT POINTER
/
/VERIFY ALL SECTORS CAN BE ACCESSED,
/
/VERIFY A WRITE ALL TO ALL OF CYLINDER 0
/AND USE DATA PATTERN 2525 + 5252,
/MAKE THE FIRST TWO WORDS IN THE BUFFER
/EQUAL THE DISK ADDRESS, CHECK THE DATA WITH
/READ ALL,
/
1122 1122          TST17,  TAD  K7740
1123 3135          DCA  TCNTR1          /SETUP SECTOR COUNTER
1124 1112          T17S,  TAD  K2525
1125 4430          FILBUF          /FILL OUTBOUND BUFFER
1126 1114          TAD  K5000          /FUNCTION WRITE ALL
1127 3151          DCA  CHREG          /SETUP COMMAND
1130 1135          TAD  TCNTR1
1131 0117          AND  K0037          /MASK OFF SECTORS
1132 3463          DCA I  XLOTRK          /SETUP ADDRESS WORD IN BUFFER
1133 1070          TAD  DRIVNO          /GET DRIVE NUMBER
1134 3464          DCA I  XHITRK          /SETUP ADDRESS WORD IN BUFFER
1135 1463          TAD I  XLOTRK
1136 4425          DISKGO          /DISK WRITE ALL
1137 1162          T17T          /TEXT POINTER
1140 5360          JMP  T17E          /ERROR, SKIP OR STATUS
1141 4431          KILBUF          /KILL DATA BUFFER
1142 1017          TAD  K1000          /FUNCTION READ ALL
1143 3151          DCA  CHREG          /SETUP COMMAND
1144 1135          TAD  TCNTR1
1145 0117          AND  K0037          /MASK OF SECTORS
1146 4425          DISKGO          /DISK READ ALL
1147 1162          T17T          /TEXT POINTER
1150 5360          JMP  T17E          /ERROR, STATUS OR SKIP
1151 1112          TAD  K2525
1152 4427          FIGURE          /WORD BY WORD COMPARE OF DATA
1153 7610          SKP CLA          /THIS SECTOR O.K.
1154 5360          JMP  T17E          /ERROR, DATA
1155 2135          ISZ  TCNTR1          /UPDATE SECTOR COUNTER
1156 5324          JMP  T17S          /TRY NEXT SECTOR
1157 4437          NERROR          /O.K. TO NEXT TEST
1160 4440          T17E,  ERROR          /ERROR, READ ALL
1161 1122          TST17          /SCOPE LOOP POINTER
1162 5373          T17T,  5373          /TEXT POINTER
/
1163 5764          JMP I  ,+1          /TO NEXT TEST
1164 1200          TST18
/
1200          PAGE

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/
/VERIFY ALL SECTORS CAN BE ACCESSED,
/
/VERIFY A WRITE DATA TO ALL OF CYLINDER 0
/AND USE DATA PATTERN 5252 + 2525,
/MAKE THE FIRST TWO WORDS OF THE BUFFER
/EQUAL THE DISK ADDRESS, CHECK THE
/DATA WITH READ DATA,
/
1200 1122          TST18,  TAD  K7740
1201 3135          DCA  TCNTR1          /SECTOR COUNTER
1202 1113          T18S,  TAD  K5252
1203 4430          FILBUF          /FILL OUTBOUND BUFFER
1204 1104          TAD  K4000          /FUNCTION WRITE DATA
1205 3151          DCA  CHREG          /SETUP COMMAND
1206 1135          TAD  TCNTR1
1207 0117          AND  K0037          /MASK OF SECTORS
1210 3463          DCA I  XLOTRK          /SETUP ADDRESS WORD IN BUFFER
1211 1070          TAD  DRIVNO          /GET DRIVE NUMBER
1212 3464          DCA I  XHITRK          /SETUP ADDRESS WORD IN BUFFER
1213 1463          TAD I  XLOTRK          /GET ADDRESS
1214 4425          DISKGO          /DISK WRITE DATA
1215 1237          T18T          /TEXT POINTER
1216 5235          JMP  T18E          /ERROR, STATUS OR SKIP
1217 4431          KILBUF          /CLEAR DATA BUFFER
1220 3151          DCA  CHREG          /SETUP COMMAND
1221 1135          TAD  TCNTR1
1222 0117          AND  K0037          /MASK OFF SECTORS
1223 4425          DISKGO          /DISK READ DATA
1224 1237          T18T          /TEXT POINTER
1225 5235          JMP  T18E          /ERROR, STATUS OR SKIP
1226 1113          TAD  K5252
1227 4427          FIGURE          /WORD BY WORD COMPARE OF DATA
1230 7610          SKP CLA          /THIS SECTOR O.K.
1231 5235          JMP  T18E          /ERROR, DATA
1232 2135          ISZ  TCNTR1          /UPDATE SECTOR COUNTER
1233 5202          JMP  T18S          /TRY NEXT SECTOR
1234 4437          NERROR          /O.K. TO NEXT TEST
1235 4440          T18E,  ERROR          /ERROR, DATA BREAK
1236 1200          TST18          /SCOPE LOOP POINTER
1237 5373          T18T,  5373          /TEXT POINTER
/
/VERIFY HALF BLOCK TRANSFERS,
/
/VERIFY THAT DISK STOPS BREAK AFTER 120
/IF THE HALF BIT IS SET, THE REMAINDER OF THE
/THE BUFFER SHOULD BE 0000,
/THE FIRST TWO WORDS OF THE BUFFER SHOULD
/EQUAL THE ABSOLUTE DISK ADDRESS,
/THE DATA PATTERN USED IS 5252 + 5252,
/
1240 1112          TST19,  TAD  K2525
1241 4430          FILBUF          /FILL BUFFER WITH DATA
1242 1070          TAD  DRIVNO

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1243 3464 DCA I XHITRK /MAKE DISK ADDRESS WORD
1244 3463 DCA I XLOTRK /MAKE DISK ADDRESS WORD
1245 1114 TAD K5000 /FUNCTION WRITE ALL
1246 1014 TAD K0100 /HALF BIT
1247 3151 DCA CMREG /SETUP COMMAND
1250 4425 DISKGO /DISK WRITE ALL
1251 1267 T19T /TEXT POINTER
1252 5265 JMP T19E /ERROR, SKIP OR STATUS
1253 4453 CLRALL /CLEAR STATUS
1254 4431 KILBUF /ZERO BUFFER
1255 1017 TAD K1000 /FUNCTION READ ALL
1256 3151 DCA CMREG /SETUP COMMAND
1257 4425 DISKGO /DISK READ ALL
1260 1267 T19T /TEXT POINTER
1261 5265 JMP T19E /ERROR, SKIP OR STATUS
1262 1112 TAD K2525
1263 4426 HAFCHK /WORD BY WORD COMPARE DATA
1264 4437 T190K, NERROR /O.K, TO NEXT TEST
1265 4440 T19E, ERROR /ERROR, DATA BREAK
1266 1240 TST19 /SCOPE LOOP POINTER
1267 5373 T19T, 5373 /TEXT POINTER
/
/VERIFY HALF BLOCK TRANSFERS.
/
/VERIFY THAT DISK STOPS BREAK AFTER 128
/IF THE HALF BIT IS SET, THE REMAINDER OF THE
/THE BUFFER SHOULD BE 0000.
/THE FIRST TWO WORDS OF THE BUFFER SHOULD
/EQUAL THE ABSOLUTE DISK ADDRESS,
/THE DATA PATTERN USED IS 5252 + 2525.
/
1270 1113 TST20, TAD K5252
1271 4430 FILBUF /FILL BUFFER WITH DATA
1272 1070 TAD DRIVNO
1273 3464 DCA I XHITRK /MAKE DISK ADDRESS WORD
1274 3463 DCA I XLOTRK /MAKE DISK ADDRESS WORD
1275 1114 TAD K5000 /FUNCTION WRITE ALL
1276 3151 DCA CMREG /SETUP COMMAND
1277 4425 DISKGO /DISK WRITE ALL
1300 1317 T20T /TEXT POINTER
1301 5315 JMP T20E /ERROR, SKIP OR STATUS
1302 4453 CLRALL /CLEAR STATUS
1303 4431 KILBUF /CLEAR BUFFER
1304 1017 TAD K1000 /FUNCTION READ ALL
1305 1014 TAD K0100 /HALF BIT
1306 3151 DCA CMREG /SETUP COMMAND
1307 4425 DISKGO /DISK READ ALL
1310 1317 T20T /TEXT POINTER
1311 5315 JMP T20E /ERROR, SKIP OR STATUS
1312 1113 TAD K5252
1313 4426 HAFCHK /WORD BY WORD COMPARE DATA
1314 4437 T200K, NERROR /O.K, TO NEXT TEST
1315 4440 T20E, ERROR /ERROR, DATA BREAK
1316 1270 TST20 /SCOPE LOOP POINTER
1317 5373 T20T, 5373 /TEXT POINTER

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/
/VERIFY HALF BLOCK TRANSFERS.
/
/VERIFY A WRITE ALL THEN READ ALL 128 WORDS.
/THE FIRST TWO WORDS OF THE BUFFER SHOULD
/EQUAL THE ABSOLUTE DISK ADDRESS,
/THE DATA PATTERN USED IS 2525 + 5252.
/
1320 1112 TST21, TAD K2525
1321 4430 FILBUF /FILL BUFFER WITH DATA
1322 1070 TAD DRIVNO
1323 3464 DCA I XHITRK /MAKE DISK ADDRESS WORD
1324 3463 DCA I XLOTRK /MAKE DISK ADDRESS WORD
1325 1114 TAD K5000 /FUNCTION WRITE ALL
1326 1014 TAD K0100 /HALF BIT
1327 3151 DCA CMREG /SETUP COMMAND
1330 4425 DISKGO /DISK WRITE ALL
1331 1350 T21T /TEXT POINTER
1332 5346 JMP T21E /ERROR, SKIP OR STATUS
1333 4453 CLRALL /CLEAR STATUS
1334 4431 KILBUF /ZERO BUFFER
1335 1017 TAD K1000 /FUNCTION READ ALL
1336 1014 TAD K0100 /HALF BIT
1337 3151 DCA CMREG /SETUP COMMAND
1340 4425 DISKGO /DISK READ ALL
1341 1350 T21T /TEXT POINTER
1342 5346 JMP T21E /ERROR, SKIP OR STATUS
1343 1112 TAD K2525
1344 4426 HAFCHK /WORD BY WORD COMPARE DATA
1345 4437 T210K, NERROR /O.K, TO NEXT TEST
1346 4440 T21E, ERROR /ERROR, DATA BREAK
1347 1320 TST21 /SCOPE LOOP POINTER
1350 5373 T21T, 5373 /TEXT POINTER
/
1351 5752 JMP I ,+1 /TO NEXT TEST
1352 1400 TST22
/
PAGE
/
/VERIFY ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
/
/VERIFY A WRITE ALL TO ALL OF CYLINDER 0
/USE DATA PATTERN 2525 + 5252
/CHECK FOR NO ERRORS IN STATUS.
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.
/
1400 1122 TST22, TAD K7740
1401 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
1402 1112 TAD K2525
1403 4430 FILBUF /FILL BUFFER WITH DATA
1404 1135 T22R1, TAD TCNTR1
1405 0117 AND K0037 /MASK SECTOR BITS
1406 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
1407 1070 TAD DRIVNO /GET DRIVE NUMBER

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1410 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
1411 1114 TAD K5000 /FUNCTION WRITE ALL
1412 3151 DCA CMREG /SETUP COMMAND
1413 1463 TAD I XLOTRK /GET TRACK AND SECTOR
1414 4425 DISKGO /DISK WRITE ALL
1415 1444 T2T /TEXT POINTER
1416 5242 JMP T22E /ERROR, STATUS OR SKIP
1417 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1420 5204 JMP T22R1 /MORE SECTORS TO GO

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 0 WAS O.K, CHECK WITH READ ALL.

```

1421 1122 TAD K7740
1422 3135 DCA TCNTR1 /COUNTER FOR 37 SECTORS
1423 4431 T22R2, KILBUF /CLEAR DATA BUFFER
1424 1031 TAD K1000 /READ ALL FUNCTION
1425 3151 DCA CMREG /SETUP COMMAND
1426 1135 TAD TCNTR1
1427 0117 AND K0037
1430 4425 DISKGO /DISK READ ALL
1431 1444 T2T /TEXT POINTER
1432 5242 JMP T22E /ERROR, STATUS OR SKIP
1433 1112 TAD K2525
1434 4427 FIGURE /WORD BY WORD COMPARE OF DATA
1435 7610 SKP CLA /BUFFER O.K.
1436 5242 JMP T22E /ERROR, DATA
1437 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1440 5223 JMP T22R2 /MORE SECTORS TO CHECK
1441 4437 NERROR /O.K, TO NEXT TEST
1442 4440 T22E, ERROR /ERROR, STATUS
1443 1400 TST2 /SCOPE LOOP POINTER
1444 5373 T2T, 5373 /TEXT POINTER

```

/VERIFY ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.

/VERIFY A WRITE DATA TO ALL OF CYLINDER 0
/USE DATA PATTERN 5252 + 2525
/CHECK FOR NO ERRORS IN STATUS.
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.

```

1445 1122 TST23, TAD K7740
1446 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
1447 1113 TAD K5252
1450 4431 FILBUF /FILL BUFFER WITH DATA
1451 1135 T23R1, TAD TCNTR1
1452 0117 AND K0037 /MASK SECTOR BITS
1453 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
1454 1070 TAD DRIVNO /GET DRIVE NUMBER
1455 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
1456 1104 TAD K4000 /FUNCTION WRITE DATA
1457 3151 DCA CMREG /SETUP COMMAND
1460 1463 TAD I XLOTRK /SECTOR TO LOAD
1461 4425 DISKGO /DISK WRITE ALL

```

```

1462 1510 T23T /TEXT POINTER
1463 5306 JMP T23E /ERROR, STATUS OR SKIP
1464 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1465 5251 JMP T23R1 /MORE SECTORS TO GO

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 0 WAS O.K, CHECK WITH READ DATA.

```

1466 1122 TAD K7740
1467 3135 DCA TCNTR1 /COUNTER FOR 37 SECTORS
1470 4431 T23R2, KILBUF /CLEAR DATA BUFFER
1471 3151 DCA CMREG /SETUP COMMAND
1472 1135 TAD TCNTR1
1473 0117 AND K0037
1474 4425 DISKGO /DISK READ DATA
1475 1510 T23T /TEXT POINTER
1476 5306 JMP T23E /ERROR, STATUS OR SKIP
1477 1113 TAD K5252
1480 4427 FIGURE /WORD BY WORD COMPARE OF DATA
1481 7610 SKP CLA /DATA O.K.
1482 5306 JMP T23E /ERROR, DATA
1483 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1484 5270 JMP T23R2 /MORE SECTORS TO CHECK
1485 4437 NERROR /O.K, TO NEXT TEST
1486 4440 T23E, ERROR /ERROR, WRITE ALL
1487 1445 TST23 /SCOPE LOOP POINTER
1490 5373 T23T, 5373 /TEXT POINTER

```

/VERIFY ALL SECTORS CAN BE ACCESSED

/VERIFY A WRITE ALL TO ALL OF CYLINDER 1450
/AND USE DATA PATTERN 2525 + 5252.
/THE FIRST TWO WORDS OF THE SECTOR SHOULD
/EQUAL THE DISK ADDRESS, CHECK THE DATA
/WITH READ ALL.

```

1511 1122 TST24, TAD K7740
1512 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
1513 1112 T24S, TAD K2525
1514 4431 FILBUF /FILL OUTBOUND BUFFER
1515 7301 CLA CLL IAC
1516 1070 TAD DRIVNO /GET DRIVE NUMBER
1517 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
1520 7301 CLA CLL IAC /EXTENDED BIT
1521 1114 TAD K5000 /FUNCTION WRITE ALL
1522 3151 DCA CMREG /SETUP COMMAND
1523 1135 TAD TCNTR1 /SECTOR COUNTER
1524 0117 AND K0037 /MASK OFF SECTOR BITS
1525 1065 TAD CYL450 /ADD IN CYLINDER
1526 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
1527 1463 TAD I XLOTRK
1530 4425 DISKGO /DISK WRITE ALL
1531 1556 T24T /TEXT POINTER
1532 5354 JMP T24E /ERROR, SKIP OR STATUS
1533 4431 KILBUF /CLEAR DATA BUFFER

```

```

1534 7301 CLA CLL IAC /EXTENDED BIT
1535 1017 TAD K1000 /FUNCTION READ ALL
1536 3151 DCA CMREG /SETUP COMMAND
1537 1135 TAD TCNTR1 /SECTOR COUNTER
1540 0117 AND K0037 /MASK OFF SECTORS
1541 1065 TAD CYL450
1542 4425 DISKGO /DISK READ ALL
1543 1556 T24T /TEXT POINTER
1544 5354 JMP T24E /ERROR, STATUS OR SKIP
1545 1112 TAD K2525
1546 4427 FIGURE /WORD BY WORD COMPARE OF DATA
1547 7610 SKP CLA /THIS SECTOR O.K.
1550 5354 JMP T24E /ERROR, DATA
1551 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1552 5313 JMP T24S /TRY NEXT SECTOR
1553 4437 NERROR /O.K. TO NEXT TEST
1554 4440 T24E, ERROR /ERROR, READ ALL
1555 1511 TST24 /SCOPE LOOP POINTER
1556 5373 T24T, 5373 /TEXT POINTER
/
1557 5760 JMP I ,+1 /TO NEXT TEST
1560 1600 TST25
/
PAGE
/
/VERIFY ALL SECTORS CAN BE ACCESSED
/
/VERIFY A WRITE DATA TO ALL OF CYLINDER 1450
/AND USE DATA PATTERN 5252 + 2525.
/THE FIRST TWO WORDS OF THE SECTOR SHOULD
/EQUAL THE DISK ADDRESS. CHECK THE DATA
/WITH READ DATA.
/
1600 1122 TST25, TAD K7740
1601 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
1602 1113 T25S, TAD K5252
1603 4430 FILBUF /FILL OUTBOUND BUFFER
1604 7301 CLA CLL IAC
1605 1070 TAD DRIVNO /GET DRIVE NUMBER
1606 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
1607 7301 CLA CLL IAC /EXTENDED BIT
1610 1104 TAD K4000 /FUNCTION WRITE DATA
1611 3151 DCA CMREG /SETUP COMMAND
1612 1135 TAD TCNTR1 /SECTOR COUNTER
1613 0117 AND K0037 /MASK OFF SECTOR BITS
1614 1065 TAD CYL450 /ADD IN CYLINDER
1615 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
1616 1463 TAD I XLOTRK
1617 4425 DISKGO /DISK WRITE DATA
1620 1644 T25T /TEXT POINTER
1621 5242 JMP T25E /ERROR, SKIP OR STATUS
1622 4431 KILBUF /CLEAR DATA BUFFER
1623 7301 CLA CLL IAC /EXTENDED BIT
1624 3151 DCA CMREG /SETUP COMMAND
1625 1135 TAD TCNTR1 /SECTOR COUNTER

```

```

1626 0117 AND K0037 /MASK OFF SECTORS
1627 1065 TAD CYL450
1630 4425 DISKGO /DISK READ DATA
1631 1644 T25T /TEXT POINTER
1632 5242 JMP T25E /ERROR, STATUS OR SKIP
1633 1113 TAD K5252
1634 4427 FIGURE /WORD BY WORD COMPARE OF DATA
1635 7610 SKP CLA /THIS SECTOR O.K.
1636 5242 JMP T25E /ERROR, DATA
1637 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1640 5202 JMP T25S /TRY NEXT SECTOR
1641 4437 NERROR /O.K. TO NEXT TEST
1642 4440 T25E, ERROR /ERROR, DATA BREAK
1643 1600 TST25 /SCOPE LOOP POINTER
1644 5373 T25T, 5373 /TEXT POINTER
/
/VERIFY ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
/
/VERIFY A WRITE ALL TO ALL OF CYLINDER 1450
/USE DATA PATTERN 5252 + 2525
/CHECK FOR NO ERRORS IN STATUS.
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.
/
1645 1122 TST26, TAD K7740
1646 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
1647 1113 TAD K5252
1650 4430 FILBUF /FILL BUFFER WITH DATA
1651 1135 T26R1, TAD TCNTR1
1652 0117 AND K0037 /MASK SECTOR BITS
1653 1065 TAD CYL450
1654 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
1655 7301 CLA CLL IAC
1656 1070 TAD DRIVNO /GET DRIVE NUMBER
1657 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
1660 7301 CLA CLL IAC /EXTENDED BIT
1661 1114 TAD K5000 /FUNCTION WRITE ALL
1662 3151 DCA CMREG /SETUP COMMAND
1663 1463 TAD I XLOTRK /GET TRACK AND SECTOR
1664 4425 DISKGO /DISK WRITE ALL
1665 1716 T26T /TEXT POINTER
1666 5314 JMP T26E /ERROR, STATUS OR SKIP
1667 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1670 5251 JMP T26R1 /MORE SECTORS TO GO
/
/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 1450 WAS O.K. CHECK WITH READ ALL.
/
1671 1122 TAD K7740
1672 3135 DCA TCNTR1 /COUNTER FOR 37 SECTORS
1673 4431 T26R2, KILBUF /CLEAR DATA BUFFER
1674 7301 CLA CLL IAC /EXTENDED BIT
1675 1017 TAD K1000 /READ ALL FUNCTION
1676 3151 DCA CMREG /SETUP COMMAND
1677 1135 TAD TCNTR1

```

```

1700 0117 AND K0037
1701 1065 TAD CYL450
1702 4425 DISKGO /DISK READ ALL
1703 1716 T26T /TEXT POINTER
1704 5314 JMP T26E /ERROR, STATUS OR SKIP
1705 1113 TAD K5252
1706 4427 FIGURE /WORD BY WORD COMPARE OF DATA
1707 7610 SKP CLA /BUFFER O.K.
1710 5314 JMP T26E /ERROR, DATA
1711 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1712 5273 JMP T26R2 /MORE SECTORS TO CHECK
1713 4437 NERROR /O.K. TO NEXT TEST
1714 4440 T26E, ERROR /ERROR, STATUS
1715 1645 TST26 /SCOPE LOOP POINTER
1716 5373 T26T, 5373 /TEXT POINTER
/
/VERIFY ALL SECTORS CAN BE ACCESSED INDIVIDUALLY.
/
/VERIFY A WRITE DATA TO ALL OF CYLINDER 1450
/USE DATA PATTERN 2525 + 5252
/CHECK FOR NO ERRORS IN STATUS.
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.
/
1717 1122 TST27, TAD K7740
1720 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
1721 1112 TAD K2525
1722 4430 FILBUF /FILL BUFFER WITH DATA
1723 1135 T27R1, TAD TCNTR1
1724 0117 AND K0037 /MASK SECTOR BITS
1725 1065 TAD CYL450
1726 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
1727 7301 CLA CLL IAC
1730 1070 TAD DRIVNO /GET DRIVE NUMBER
1731 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
1732 7301 CLA CLL IAC /EXTENDED BIT
1733 1104 TAD K4000 /FUNCTION WRITE DATA
1734 3151 DCA CMREG /SETUP COMMAND
1735 1463 TAD I XLOTRK /SECTOR TO LOAD
1736 4425 DISKGO /DISK WRITE ALL
1737 1767 T27T /TEXT POINTER
1740 5365 JMP T27E /ERROR, STATUS OR SKIP
1741 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1742 5323 JMP T27R1 /MORE SECTORS TO GO
/
/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 1450 WAS O.K. CHECK WITH READ DATA.
/
1743 1122 TAD K7740
1744 3135 DCA TCNTR1 /COUNTER FOR 37 SECTORS
1745 4431 T27R2, KILBUF /CLEAR DATA BUFFER
1746 7301 CLA CLL IAC /FUNCTION READ DATA
1747 3131 DCA CMREG /SETUP COMMAND
1750 1135 TAD TCNTR1
1751 0117 AND K0037

```

```

1752 1065 TAD CYL450
1753 4425 DISKGO /DISK READ DATA
1754 1767 T27T /TEXT POINTER
1755 5365 JMP T27E /ERROR, STATUS OR SKIP
1756 1112 TAD K2525
1757 4427 FIGURE /WORD BY WORD COMPARE OF DATA
1760 7610 SKP CLA /DATA O.K.
1761 5365 JMP T27E /ERROR, DATA
1762 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
1763 5345 JMP T27R2 /MORE SECTORS TO CHECK
1764 4437 NERROR /O.K. TO NEXT TEST
1765 4440 T27E, ERROR /ERROR, WRITE ALL
1766 1717 TST27 /SCOPE LOOP POINTER
1767 5373 T27T, 5373 /TEXT POINTER
/
/SECTOR TIMING TEST; VERIFY CONSECUTIVE SECTORS,
/VERIFY THAT WRITE AND READ ALL ARE ACTUALLY DOING CONSECUTIVE
/SECTORS, WHEN DOING CONSECUTIVE SECTORS IN WRITE OR READ
/ALL MODE, SECTOR TRANSFERS SHOULD OCCUR EVERY 2.5 MILLI-
/SECONDS. THE PROGRAM WILL REPORT A STATUS ERROR OF
/NO DONE FLAG IF THIS DOES NOT OCCUR.
/
1770 1157 TAD HOMEHA
1771 1070 TAD DRIVNO
1772 3137 DCA TCNTR3 /SAVE FIELD + DRIVE
1773 1122 TST28, TAD K7740
1774 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
1775 1114 TAD K5000 /FUNCTION WRITE ALL
1776 3151 DCA CMREG /SETUP COMMAND
1777 7340 CLA CLL CMA
2000 1117 TAD K0037 /SECTOR TO GO
2001 4425 DISKGO /DISK WRITE ALL
2002 2055 T28T /TEXT POINTER
2003 5253 JMP T28E /ERROR, DISK SKIP OR STATUS
2004 1170 TAD K5300
2005 3255 DCA T28T /MODIFY TEXT POINTER
2006 1135 T28R, TAD TCNTR1
2007 0072 AND K0001
2010 7112 CLL RTR
2011 1017 TAD K1000 /MAKE READ ALL OR WRITE ALL
2012 1137 TAD TCNTR3 /GET FIELD + DRIVE
2013 6746 T28IOA, DLDC /LOAD COMMAND REGISTER
2014 1067 TAD BGNBUF /GET BEGINNING OF BUFFER POINTER
2015 6744 T28IOB, DLCA /LOAD CURRENT ADDRESS
2016 1135 TAD TCNTR1
2017 0117 AND K0037 /MASK SECTOR BITS
2020 6743 T28IOC, DLG /LOAD AND GO
2021 1176 TAD KTIME
2022 3136 DCA TCNTR2 /TIME COUNTER
2023 6745 T28IOD, DRST /READ STATUS REGISTER
2024 1104 TAD K4000
2025 745 SNA /HAS STATUS 4000
2026 5258 JMP T28OK /YES, GOT TRANSFER DONE
2027 2136 ISZ TCNTR2 /UPDATE TIME COUNTER
2030 5223 JMP T28IOD /WAIT FOR GOOD STATUS

```

```

2031 1104 TAD K4000 /SUBTRACT, RESET STATUS
2032 3147 DCA STREG /SAVE FOR ERROR PRINTER
2033 1135 TAD TCNTR1
2034 0072 AND K0001
2035 7112 CLL RTR
2036 1017 TAD K1000 /MAKE READ ALL OR WRITE ALL
2037 3151 DCA CMREG /SAVE FOR ERROR PRINTER
2040 1067 TAD 0GNBUF /GET START OF BUFFER
2041 3153 DCA CAREG /SAVE FOR PRINTER
2042 1135 TAD TCNTR1
2043 0117 AND K0037 /MAKE SECTOR ADDRESS
2044 3152 DCA DAREG /SAVE FOR ERROR PRINTER
2045 4447 DSKSKP /ERROR, HAVE TO WAIT FOR FLAG
2046 5245 JMP , -1 /HANG IF NO SKIP
2047 5253 JMP T20E /ERROR, SECTOR RESPONSE NOT FOUND
2050 2135 T280K, ISZ TCNTR1 /UPDATE SECTOR COUNTER
2051 5206 JMP T20R /MORE TO TEST
2052 4437 NERROR /O.K, TO NEXT TEST
2053 4440 T28E, ERROR /ERROR, WRITE OR READ ALL
2054 1773 TST28 /SCOPE LOOP POINTER
2055 5300 T28T, 5300 /TEXT POINTER

```

/SECTOR TIMING TEST; VERIFY NON-CONSECUTIVE SECTORS,
/VERIFY THAT READ AND WRITE DATA ARE NOT DOING CONSECUTIVE
/SECTORS. WHEN TRYING TO DO CONSECUTIVE SECTORS IN READ DATA
/OR WRITE DATA MODE, SECTOR TRANSFERS SHOULD OCCUR EVERY DISK
/REVOLUTION, APPROX. EVERY 40 MILLISECONDS. THE PROGRAM WILL
/REPORT AN ERROR OF A DONE FLAG IF THIS DOES NOT OCCUR

```

2056 1122 TST29, TAD K7740
2057 3135 DCA TCNTR1 /SECTOR COUNTER
2060 3151 DCA CMREG /SETUP COMMAND
2061 1117 TAD K0037
2062 4425 DISKGO /DISK READ DATA
2063 2133 T29T /TEXT POINTER
2064 5331 JMP T29E /ERROR, SKIP OR STATUS
2065 1170 TAD K5300
2066 3333 DCA T29T /MODIFY TEXT POINTER
2067 5144 DCA GDREG2 /EXPECTED STATUS
2070 1135 T29R, TAD TCNTR1
2071 0072 AND K0001
2072 7112 CLL RTR /MAKE READ OR WRITE
2073 1137 TAD TCNTR3 /GET FIELD * DRIVE
2074 6746 T2910A, DLDC /LOAD COMMAND REGISTER
2075 1067 TAD 0GNBUF
2076 6744 T2910B, DLCA /LOAD CURRENT ADDRESS
2077 1135 TAD TCNTR1
2080 0117 AND K0037 /MASK SECTOR BITS
2101 6743 T2910C, DLAG /LOAD AND GO
2102 1176 TAD KTIME
2103 3136 DCA TCNTR2 /TIME COUNTER
2104 6745 T2910D, DRST /READ STATUS REGISTER
2105 7450 SNA /STATUS O.K.?
2106 5322 JMP T29W /WAIT FOR CORRECT RESPONSE (0000)

```

```

2107 3147 DCA STREG /NO, SAVE STATUS FOR PRINTER
2110 1135 TAD TCNTR1
2111 0072 AND K0001
2112 7112 CLL RTR /MAKE READ OR WRITE
2113 3151 DCA CMREG /SAVE FOR ERROR PRINTER
2114 1067 TAD 0GNBUF /GET START OF BUFFER
2115 3153 DCA CAREG /SAVE FOR ERROR PRINTER
2116 1135 TAD TCNTR1
2117 0117 AND K0037 /MAKE SECTOR ADDRESS
2120 3152 DCA DAREG /SAVE FOR ERROR PRINTER
2121 5331 JMP T29E /ERROR, SECTOR RESPONSE NOT FOUND
2122 2136 T29W, ISZ TCNTR2 /UPDATE TIME COUNTER
2123 5304 JMP T2910D /WAIT FOR GOOD STATUS
2124 4447 DSKSKP /ERROR, HAVE TO WAIT FOR FLAG
2125 5324 JMP , -1 /HANG IF NO SKIP
2126 2135 T290K, ISZ TCNTR1 /UPDATE SECTOR COUNTER
2127 5270 JMP T29R /MORE TO TEST
2130 4437 NERROR /O.K, TO NEXT TEST
2131 4440 T29E, ERROR /ERROR, STATUS
2132 2056 TST29 /SCOPE LOOP POINTER
2133 5300 T29T, 5300 /MODIFIED TEXT POINTER

```

/CRC TEST
/
/DATA TRANSFER IS WORKING. NOW CHECK CRC WORD IN
/THE CRC REGISTER AFTER A READ ALL. THE CRC SHOULD BE
/ALL 0'S FOR ALL 0'S DATA PATTERN.

```

2134 1107 TST30, TAD K7760
2135 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
2136 7301 T30R, CLA CLL IAC
2137 4453 CLRALL /CLEAR CONTROL
2140 4431 KILBUF /CLEAR BUFFER AREA
2141 1114 TAD K5000 /FUNCTION WRITE ALL
2142 3151 DCA CMREG /SETUP COMMAND
2143 1135 TAD TCNTR1
2144 0116 AND K0017 /MASK SECTOR BITS
2145 4425 DISKGO /DISK WRITE ALL
2146 2176 T30T /TEXT POINTER
2147 5374 JMP T30E /ERROR, STATUS OR SKIP
2150 1017 TAD K1000 /FUNCTION READ ALL
2151 3151 DCA CMREG /SETUP COMMAND
2152 1135 TAD TCNTR1
2153 0116 AND K0017 /MASK SECTOR BITS
2154 4425 DISKGO /DISK READ ALL
2155 2176 T30T /TEXT POINTER
2156 5374 JMP T30E /ERROR, STATUS OR SKIP
2157 1171 TAD K6304
2160 3376 DCA T30T /MODIFY TEXT POINTER
2161 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
2162 4453 CLRALL /AND CLEAR BRK ENABLE FLOP
2163 3143 DCA GDREG1 /STORE IN COMPARE REGISTER
2164 3144 DCA GDREG2 /STORE IN COMPARE REGISTER
2165 4454 RDCRC /READ CRC REGISTER
2166 4443 ACCMP2 /CHECK RESULTS

```

```

2167 761. SKP CLA /O,K,
2170 5374 JMP T30E /ERROR, CRC
2171 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2172 5336 JMP T30R /MORE SECTORS TO TEST
2173 4437 NERROR /O,K, TO NEXT TEST
2174 4440 T30E, ERROR /ERROR, CRC
2175 2134 TST30 /SCOPE LOOP POINTER
2176 6304 T30T, 6304 /TEXT POINTER
/
/CRC TEST
/
/VERIFY THAT THE CRC WORD WRITTEN
/ON DISK IS CORRECT. COMPARE IT TO
/KNOWN VALUE IN CORE. ON A READ ALL THE
/CRC READ FROM DISK IS LEFT IN THE CRC BUFFER,
/THE CRC SHOULD BE 116047 FOR DATA 2525 + 5252,
/
2177 1107 TST31, TAD K7760
2200 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
2201 7301 T31R, CLA CLL IAC
2202 4453 CLRALL /CLEAR CONTROL
2203 1112 TAD K2525
2204 4430 FILBUF /FILL DATA BUFFER
2205 1114 TAD K5000 /FUNCTION WRITE ALL
2206 3151 DCA CMREG /SETUP COMMAND
2207 1135 TAD TCNTR1
2210 0116 AND K0017 /MASK SECTOR BITS
2211 1107 TAD K7760
2212 4425 DISK00 /DISK WRITE ALL
2213 2246 T31T /TEXT POINTER
2214 5244 JMP T31E /ERROR, STATUS OR SKIP
2215 1017 TAD K1000 /FUNCTION READ ALL
2216 3151 DCA CMREG /SETUP COMMAND
2217 1135 TAD TCNTR1
2220 0116 AND K0017 /MASK SECTOR BITS
2221 1107 TAD K7760
2222 4425 DISK00 /DISK READ ALL
2223 2246 T31T /TEXT POINTER
2224 5244 JMP T31E /ERROR, STATUS OR SKIP
2225 1171 TAD K6304
2226 3246 DCA T31T /MODIFY TEXT POINTER
2227 7301 CLA CLL IAC /ENABLE CLEAR CONTROL AND
2230 4453 CLRALL /CLEAR BRK ENABLE FLOP,
2231 1162 TAD CRWRD1 /GET GOOD CRC
2232 3143 DCA GDREG1 /STORE IN COMPARE REGISTER
2233 1163 TAD CRWRD2 /GET GOOD CRC
2234 3144 DCA GDREG2 /STORE IN COMPARE REGISTER
2235 4454 RDCRC /HEAD CRC REGISTER
2236 4443 ACCHP2 /CHECK RESULTS
2237 7010 SKP CLA /O,K,
2240 5244 JMP T31E /ERROR, CRC
2241 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2242 5201 JMP T31R /MORE SECTORS TO TEST
2243 4437 NERROR /O,K, TO NEXT TEST
2244 4440 T31E, ERROR /ERROR, CRC

```

```

2245 2177 TST31 /SCOPE LOOP POINTER
2246 6304 T31T, 6304 /TEXT POINTER
/
/VERIFY HEAD MOTION AND CAPABILITY
/OF SELECTING TWO TRACKS INDIVIDUALLY.
/
/VERIFY A WRITE ALL TO ALL OF CYLINDER 3450
/AND THEN CYLINDER 0. USE DATA PATTERN 3252 + 2525 ON
/CYLINDER 1450 AND 2525 + 5252 ON CYLINDER 0,
/CHECK FOR NO ERRORS IN STATUS.
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.
/
/FIRST WRITE CYLINDER 1450
/
2247 1122 TST32, TAD K7740
2250 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
2251 1113 TAD K5252
2252 4430 FILBUF /FILL BUFFER WITH DATA
2253 7301 CLA CLL IAC
2254 1070 TAD DRIVNO /GET DRIVE NUMBER
2255 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
2256 1135 T32R1, TAD TCNTR1
2257 0117 AND K0037 /MASK SECTOR BITS
2260 1065 TAD CYL450 /LOWER CYLINDER
2261 3463 DCA I XLOTRK /SETUP WORD IN BUFFER
2262 7301 CLA CLL IAC
2263 1114 TAD K5000 /FUNCTION WRITE ALL
2264 3151 DCA CMREG /SETUP COMMAND
2265 1463 TAD I XLOTRK /SECTOR TO GO
2266 4425 DISK00 /DISK WRIT ALL
2267 2361 T32T /TEXT POINTER
2270 5357 JMP T32E /ERROR, STATUS OR SKIP
2271 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2272 5256 JMP T32R1 /MORE SECTORS TO GO
/
/WRITE ALL TO ALL OF CYLINDER 0
/
2273 1122 TAD K7740
2274 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
2275 1112 TAD K2525
2276 4430 FILBUF /FILL BUFFER WITH DATA
2277 1135 T32R2, TAD TCNTR1
2300 0117 AND K0037 /MASK SECTOR BITS
2301 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
2302 1070 TAD DRIVNO /GET DRIVE NUMBER
2303 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
2304 1114 TAD K5000 /FUNCTION WRITE ALL
2305 3151 DCA CMREG /SETUP COMMAND
2306 1463 TAD I XLOTRK /SECTOR TO GO
2307 4425 DISK00 /DISK WRITE ALL
2310 2361 T32T /TEXT POINTER
2311 5357 JMP T32E /ERROR, SKIP OR STATUS
2312 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2313 5277 JMP T32R2 /MORE SECTORS TO GO

```

```

/
/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 1450 WAS O.K. CHECK WITH READ ALL,
/
2314 1122 TAD K7740
2315 3135 DCA TCNTR1 /COUNTER FOR 37 SECTORS
2316 4431 T32R3, KILBUF /CLEAR DATA BUFFER
2317 7301 CLA CLL IAC
2320 1017 TAD K1000 /READ ALL FUNCTION
2321 3151 DCA CMREG /SETUP COMMAND
2322 1135 TAD TCNTR1
2323 0117 AND K0037
2324 1065 TAD /ADD IN CYLINDER
2325 4425 DISKGO /DISK READ ALL
2326 2361 T32T /TEXT POINTER
2327 5357 JMP T32E /ERROR, STATUS OR SKIP
2330 1113 TAD K5252
2331 4427 FIGURE /WORD BY WORD COMPARE OF DATA
2332 7610 SKP CLA /DATA O.K.
2333 5357 JMP T32E /ERROR, DATA
2334 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2335 5316 JMP T32R3 /MORE SECTORS TO CHECK
/
/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 0 WAS O.K. CHECK WITH READ ALL,
/
2336 1122 TAD K7740
2337 3135 DCA TCNTR1 /COUNTER FOR 37 SECTORS
2340 4431 T32R4, KILBUF /CLEAR DATA BUFFER
2341 1017 TAD K1000 /READ ALL FUNCTION
2342 3151 DCA CMREG /SETUP COMMAND
2343 1135 TAD TCNTR1
2344 0117 AND K0037
2345 4425 DISKGO /DISK READ ALL
2346 2361 T32T /TEXT POINTER
2347 5357 JMP T32E /ERROR, STATUS OR SKIP
2350 1112 TAD K2525
2351 4427 FIGURE /WORD BY WORD COMPARE OF DATA
2352 7610 SKP CLA /DATA O.K.
2353 5357 JMP T32E /ERROR, DATA
2354 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2355 5340 JMP T32R4 /MORE SECTORS TO CHECK
2356 4437 NERROR /O.K. TO NEXT TEST
2357 4440 T32E, ERROR /ERROR, WRITE ALL
2360 2247 TST32 /SCOPE LOOP POINTER
2361 5373 T32T, 5373 /TEXT POINTER
/
2362 5763 JMP I ,+1 /TO NEXT TEST
2363 2400 TST33
/
PAGE
/
/VERIFY HEAD MOTION AND CAPABILITY
/OF SELECTING TWO TRACKS INDIVIDUALLY,
/

```

```

/VERIFY A WRITE DATA TO ALL OF CYLINDER 0
/THEN CYLINDER 1450. USE DATA PATTERN 2525 ON
/CYLINDER 1450 AND 5252 + 2525 ON CYLINDER 0,
/CHECK FOR NO ERRORS IN STATUS,
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ADDRESS OF SECTOR.
/
/FIRST WRITE DATA TO CYLINDER 0,
/
2400 1122 TST33, TAD K7740
2401 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
2402 1113 TAD K5252
2403 4430 FILBUF /FILL BUFFER WITH DATA
2404 7300 T33R1, CLA CLL
2405 1135 TAD TCNTR1
2406 0117 AND K0037 /MASK OFF SECTOR BITS
2407 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
2410 1070 TAD DRIVNO /GET DRIVE NUMBER
2411 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
2412 1104 TAD K4000 /FUNCTION WRITE DATA
2413 3151 DCA CMREG /SETUP COMMAND
2414 1463 TAD I XLOTRK /SECTOR TO LOAD
2415 4425 DISKGO /DISK WRITE DATA
2416 2511 T33T /TEXT POINTER
2417 5307 JMP T33E /ERROR, STATUS OR SKIP
2420 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2421 5204 JMP T33R1 /MORE SECTORS TO GO
/
/WRITE DATA TO ALL OF CYLINDER 1450
/
2422 1122 TAD K7740
2423 3135 DCA TCNTR1 /SETUP SECTOR COUNTER
2424 1112 TAD K2525
2425 4430 FILBUF /FILL BUFFER WITH DATA
2426 7301 CLA CLL IAC
2427 1070 TAD DRIVNO /GET DRIVE NUMBER
2430 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
2431 1135 T33R2, TAD TCNTR1
2432 0117 AND K0037 /MASK OFF SECTOR BITS
2433 1065 TAD CYL450 /ADD IN CYLINDER
2434 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
2435 7301 CLA CLL IAC /EXTENDED TRACK BIT
2436 1104 TAD K4000 /FUNCTION WRITE DATA
2437 3151 DCA CMREG /SETUP COMMAND
2440 1463 TAD I XLOTRK /SECTOR TO LOAD
2441 4425 DISKGO /DISK WRITE DATA
2442 2511 T33T /TEXT POINTER
2443 5307 JMP T33E /ERROR, STATUS OR SKIP
2444 2135 ISZ TCNTR1 /UPDATE SECTOR COUNTER
2445 5231 JMP T33R2 /MORE SECTORS TO GO
/
/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 0 WAS O.K. CHECK WITH READ DATA,
/
2446 1122 TAD K7740

```

```

2447 3135          DCA      TCNTR1      /COUNTER FOR 37 SECTORS
2450 4431 T33R3,  KILBUF      /CLEAR DATA BUFFER
2451 3151          DCA      CMREG        /SETUP COMMAND
2452 1135          TAD      TCNTR1
2453 0117          AND      K0037
2454 4425          DISKGO     /DISK READ DATA
2455 2511          T33T      /TEXT POINTER
2456 5307          JMP      T33E      /ERROR, STATUS OR SKIP
2457 1113          TAD      K5252
2460 4427          FIGURE     /WORD BY WORD COMPARE OF DATA
2461 7610          SKP CLA     /DATA O.K.
2462 5307          JMP      T33E      /ERROR, DATA
2463 2135          ISZ      TCNTR1     /UPDATE SECTOR COUNTER
2464 3250          JMP      T33R3     /MORE SECTORS TO CHECK

```

/VERIFY THAT THE DATA WRITTEN ABOVE
/ON CYLINDER 1450 WAS O.K. CHECK WITH READ DATA.

```

2465 1122          TAD      K7740
2466 3135          DCA      TCNTR1      /SECTOR COUNTER
2467 4431 T33R4,  KILBUF      /CLEAR DATA BUFFER
2470 7301          CLA CLL IAC
2471 3151          DCA      CMREG        /SETUP COMMAND
2472 1135          TAD      TCNTR1
2473 0117          AND      K0037
2474 1065          TAD      CYL450
2475 4425          DISKGO     /ADD IN CYLINDER
2476 2511          T33T      /DISK READ DATA
2477 5307          JMP      T33E      /TEXT POINTER
2500 1112          TAD      K2525
2501 4427          FIGURE     /ERROR, STATUS OR SKIP
2502 7610          SKP CLA     /WORD BY WORD COMPARE OF DATA
2503 5307          JMP      T33E      /DATA O.K.
2504 2135          ISZ      TCNTR1     /ERROR, DATA
2505 5267          JMP      T33R4     /UPDATE SECTOR COUNTER
2506 4437          NERROR     /MORE SECTORS TO CHECK
2507 4440          T33E,  ERROR     /O.K. TO NEXT TEST
2510 2400          T33T,  TST33     /ERROR, WRITE DATA
2511 5373          T33T,  5373     /SCOPE LOOP POINTER

```

/FORCE CYLINDER ADDRESS ERROR
/VERIFY A CYLINDER ADDRESS ERROR IN
/STATUS REGISTER, CAN BE CAUSED BY ISSUING
/MAINTENANCE SHIFT CRC AFTER DISK
/HAS ACCEPTED THE ADDRESS.

```

2512 7301 TST34,  CLA CLL IAC
2513 4453          CLRALL     /CLEAR CONTROL
2514 4423          SEEK      /SEEK ONLY TRACK 0
2515 2546          T34T      /TEXT POINTER
2516 5344          JMP      T34E      /ERROR, SKIP OR STATUS
2517 7301          CLA CLL IAC
2520 1157          TAD      HOMEHA
2521 1070          TAD      DRIVNO

```

```

2522 1104          TAD      K4000      /TOTAL COMMAND WRITE DATA,
2523 4452          LDCMD     /LOAD COMMAND REGISTER
2524 7301          CLA CLL IAC
2525 1104          TAD      K4000
2526 3144          DCA      GDREG2     /EXPECTED STATUS
2527 1066          TAD      TRK212
2530 4452          LDADD     /LOAD AND GO READ
2531 7330          CLA CLL CML RAR
2532 4455          LDMAN     /ENTER MAINTENANCE
2533 7010          RAR
2534 4455          LDMAN     /SET DB4 FOR ENABLE SHIFT
2535 7010          RAR
2536 4455          LDMAN     /SHIFT CRC
2537 4447          DSKSKP     /WAIT FOR FLAG
2540 5337          JMP      ,-1
2541 4444          RDSTAT     /READ STATUS REGISTER
2542 4442          ACCMP1     /CHECK RESULTS
2543 4437          NERROR     /O.K. TO NEXT TEST
2544 4440          T34E,  ERROR     /ERROR, CYLINDER ADDRESS
2545 2512          TST34     /SCOPE LOOP POINTER
2546 5300          T34T,  5300     /TEXT POINTER

```

```

2547 5750          /
2550 2600          JMP I      ,-1      /TO NEXT TEST

```

/PAGE
/FORCE CRC ERROR
/VERIFY A CRC ERROR BY ENTERING MAINTENANCE
/AND SHIFTING CRC IN WRITE ALL MODE.

```

2600 7301 TST35,  CLA CLL IAC
2601 4453          CLRALL     /CLEAR CONTROL
2602 4431          KILBUF     /CLEAR BUFFER AREA
2603 1067          TAD      BGNBUF
2604 4451          LDCUR     /LOAD CURRENT ADDRESS
2605 1157          TAD      HOMEHA
2606 1070          TAD      DRIVNO
2607 1114          TAD      K5000
2610 4450          LDCMD     /TOTAL WRITE COMMAND
2611 4452          LDADD     /LOAD COMMAND
2612 7330          CLA CLL CML RAR /LOAD AND GO WRITE ALL
2613 4455          LDMAN     /ENTER MAINTENANCE
2614 7010          RAR
2615 4455          LDMAN     /SET DB4 TO ENABLE SHIFT
2616 7010          RAR
2617 1073          TAD      K0002
2620 4455          LDMAN     /SET AC BIT 10 DATA
2621 4447          DSKSKP     /SHIFT CRC
2622 5220          JMP      ,-2      /SKIP ON ERROR FLAG
2623 7301          CLA CLL IAC /KEEP SHIFTING CRC TILL ERROR
2624 4453          CLRALL
2625 7330          CLA CLL CML RAR /CLEAR CONTROL
2626 1011          TAD      K0010

```

```

2627 3144 DCA GOREG2 /EXPECTED STATUS REGISTER
2630 1067 TAD BGNBUF
2631 4451 LDCUR /LOAD CURRENT ADDRESS
2632 1157 TAD HOMEHA
2633 1070 TAD DRIVNO
2634 1017 TAD K1000 /TOTAL HEAD ALL COMMAND
2635 4450 LDCMD /LOAD COMMAND REGISTER
2636 4452 LDADD /LOAD AND GO READ ALL
2637 4447 DSKSKP /WAIT AND SKIP ON CRC ERROR!
2640 5237 JMP ,-1
2641 4444 ROSTAT /READ STATUS REGISTER
2642 4442 ACCMP1 /CHECK RESULTS
2643 4437 NERROR /O.K. TO NEXT TEST
2644 4440 T35E, ERROR /ERROR, CRC ERROR
2645 2600 TST35 /SCOPE POINTER
2646 5300 5300 /TEXT POINTER

/
/BIG ADDRESSING TEST
/FORMAT THE COMPLETE DISK SURFACE WITH
/WRITE ALL. USE DATA PATTERN 2525 * 5252
/MAKE FIRST TWO WORDS OF EVERY SECTOR
/EQUAL TO ABSOLUTE ADDRESS OF SECTOR.
/
2647 7301 TST36, CLA CLL IAC
2650 4453 CLRALL /CLEAR CONTROL
2651 1112 TAD K2525
2652 4430 FILBUF /FILL BUFFER WITH DATA
2653 3463 DCA I XLOTRK /COUNTER + TRACK WORD
2654 1070 TAD DRIVNO /GET DRIVE NUMBER
2655 3464 DCA I XHITRK /COUNTER + TRACK WORD
2656 1070 TAD DRIVNO /CURRENT DRIVE
2657 1157 TAD HOMEHA /CURRENT FIELD
2660 1114 TAD K5000 /FUNCTION WRITE ALL
2661 3151 DCA CMREG /SETUP COMMAND
2662 1067 TAD BGNBUF /GET START OF BUFFER
2663 3153 DCA CAREG /FOR ERROR PRINTER
2664 7330 T36R, CLA CLL CML RAR
2665 3144 DCA GOREG2 /SETUP EXPECTED STATUS COMPARE
2666 1067 TAD BGNBUF /START OF BUFFER
2667 6744 IOT4A1, DLCA /LOAD CURRENT ADDRESS
2670 1151 TAD CMREG /LAST COMMAND
2671 6746 IOT6A1, DLDC /LOAD COMMAND REGISTER
2672 1463 TAD I XLOTRK /SECTOR TO LOAD
2673 6743 IOT3A1, DLAG /LOAD AND GO
2674 6741 IOT1A1, DSKP /DISK SKIP IOT
2675 5274 JMP ,-1 /WAIT FOR FLAG
2676 6745 IOT5A1, DRST /READ STATUS
2677 1104 TAD K4000 /ADD IN FUDGE FACTOR
2700 7440 SZA /STATUS O.K.???
2701 5317 JMP T36E /NO, STATUS ERROR
2702 2463 ISZ I XLOTRK
2703 5306 JMP ,+3 /DON'T SET EXTENDED TRACK
2704 2151 ISZ CMREG /YES, SET IT
2705 2464 ISZ I XHITRK /SETUP BUFFER ALSO
2706 1464 TAD I XHITRK /GET TRACK WORD

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2707 7110 CLL RAR /GET EXTENDED BIT TO LINK
2710 7620 SNL CLA /WAS IT SET
2711 5264 JMP T36R /NO, CONTINUE
2712 1463 TAD I XLOTRK /GET LOWER TRACK WORD
2713 1172 TAD ENDTRK /ADD IN FUDGE FACTOR
2714 7640 SZA CLA /DONE WITH DISK
2715 5264 JMP T36R /NO, MORE TO GO
2716 5324 JMP T36N /DONE
2717 1104 T36E, TAD K4000 /RESET STATUS
2720 3147 DCA STREG /SAVE FOR ERROR PRINTER
2721 1463 TAD I XLOTRK /GET ADDRESS
2722 3152 DCA DAREG /FOR ERROR PRINTER
2723 7410 SKP /REPORT ERROR!
2724 4437 T36N, NERROR /O.K. TO NEXT TEST
2725 4440 ERROR /ERROR, STATUS
2726 2647 TST36 /SCOPE LOOP POINTER
2727 5300 T36T, 5300 /TEXT POINTER

/
2730 5731 JMP I ,+1 /TO NEXT TEST
2731 3000 TST37

/
PAGE
/
/BIG ADDRESSING CHECK!
/IF A DATA ERROR SHOULD HAPPEN TO OCCUR
/WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
/SHOULD REALIZE THAT THE PROBLEM COULD BE
/ADDRESSING.
/
/
/VERIFY THAT THE DATA ON DISK IS CORRECT
/CHECK THE COMPLETE SURFACE
/THE DATA ON THE COMPLETE DISK SHOULD BE 2525 * 5252,
/HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
/SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
/
3000 3135 TST37, DCA TONTR1
3001 1017 TAD K1000 /FUNCTION READ ALL
3002 1157 TAD HOMEHA /CURRENT FIELD
3003 1070 TAD DRIVNO /CURRENT DRIVE
3004 3151 DCA CMREG /SETUP COMMAND
3005 1207 TAD ,+2 /GET TEXT POINTER
3006 7410 SKP
3007 3077 T37T /TEXT POINTER
3010 3174 DCA SAVPCT /SAVE FOR CRC ERROR
3011 1067 TAD BGNBUF /GET START OF BUFFER
3012 3153 DCA CAREG /SAVE FOR ERROR PRINTER
3013 7340 T37R, CLA CLL CMA
3014 3173 DCA SOFERR /SETUP CRC ERROR POINTER
3015 4431 KILBUF /CLEAR DATA BUFFER
3016 1135 TAD TONTR1 /LOWER DISK ADDRESS
3017 3152 DCA DAREG /SAVE FOR PRINTER
3020 1067 TAD BGNBUF /GET START OF BUFFER
3021 6744 IOT4A2, DLCA /LOAD CURRENT ADDRESS
3022 1151 TAD CMREG /GET COMMAND

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3023 6746 IOT6A2, DLDC /LOAD COMMAND REGISTER
3024 1135 TAD TCNTR1 /GET DISK ADDRESS
3025 6743 IOT3A2, DLAG /LOAD DISK ADDRESS AND GO
3026 6741 IOT1A2, DSKP /DISK SKIP IOT
3027 5226 JMP , -1 /WAIT FOR DISK SKIP
3030 6745 IOT5A2, DRST /READ STATUS
3031 3147 DCA STREG /SAVE FOR ERROR PRINTER
3032 1147 TAD STREG
3033 1104 TAD K4000
3034 7650 SNA CLA /ADD IN FUDGE FACTOR
3035 5251 JMP T37A /STATUS O.K.
3036 7330 CLA CLL CML RAR /NO STATUS ERRORS
3037 3144 DCA GDREG2 /EXPECTED STATUS
3040 1147 TAD STREG /SETUP COMPARE REGISTER
3041 0011 AND K0010 /GET STATUS READ
3042 7640 SEA CLA /MASK FOR CRC
3043 5247 JMP , +4 /HAS IT CRC ERROR
3044 1170 TAD K5300 /YES CRC ERROR
3045 3277 DCA T37T /GET TEXT POINTER
3046 5275 JMP T37E /SAVE IT
3047 3173 DCA SOFERR /STATUS ERROR NOT CRC
3050 5253 JMP , +3 /SET CRC ERROR POINTER
3051 7301 T37A, CLA CLL IAC /DON'T CLEAR CONTROL
3052 6742 IOT2A2, DCLR /ENABLE CLEAR CONTROL
3053 1167 TAD K5373 /CLEAR CONTROL
3054 3277 DCA T37T
3055 1112 TAD K2525 /SETUP TEXT POINTER
3056 4427 FIGURE /GET EXPECTED DATA
3057 7610 SKP CLA /CHECK DATA READ
3060 5275 JMP T37E /THIS ONE O.K.
3061 2135 ISZ TCNTR1 /ERROR, DATA
3062 7610 SKP CLA /UPDATE LOWER DISK ADDRESS
3063 2151 ISZ CMREG /SET EXTENDED BIT
3064 1151 TAD CMREG
3065 0072 AND K0001
3066 7650 SNA CLA /IS EXTENDED SET
3067 5213 JMP T37R /NO, CONTINUE
3070 1135 TAD TCNTR1
3071 1172 TAD ENDTRK
3072 7640 SEA CLA /ADD IN FUDGE FACTOR
3073 5213 JMP T37R /DONE WITH DISK
3074 4437 NERROR /NO, MORE TO GO
3075 4442 T37E, ERROR /O.K., TO NEXT TEST
3076 3000 TST37 /ERROR, STATUS
3077 5300 T37T, 5300 /SCOPE LOOP POINTER
 /TEXT POINTER

```

```

/
/BIG ADDRESSING CHECK!
/IF A DATA ERROR SHOULD HAPPEN TO OCCUR
/WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
/SHOULD REALIZE THAT THE PROBLEM COULD BE
/ADDRESSING.
/
/READ ALL SECTORS ON THE DISK AND CHECK
/THE STATUS. IF STATUS ERROR OCCURS THEN CHECK THE DATA.
/THE DATA ON THE COMPLETE DISK SHOULD BE 2525 + 5252.

```

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/
/ HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
/ SHOULD EQUAL THE ABSOLUTE DISK ADDRESS.
/
3100 7340 TST38, CLA CLL CMA
3101 3173 DCA SOFERR /SETUP CRC ERROR POINTER
3102 3135 DCA TCNTR1 /SETUP LOWER ADDRESS
3103 3136 DCA TCNTR2 /SETUP EXTENDED
3104 1017 TAD K1000 /FUNCTION READ ALL
3105 1070 TAD DRIVNO /CURRENT DRIVE
3106 1157 TAD HOMEMA /CURRENT FIELD
3107 3151 DCA CMREG /SETUP COMMAND
3110 1067 T38R, TAD 9GNBUF /START OF BUFFER
3111 4451 LDCUR /LOAD CURRENT
3112 1151 TAD CMREG /LAST COMMAND ISSUED
3113 4452 LDCMD /LOAD COMMAND
3114 1135 TAD TCNTR1 /LOWER ADDRESS
3115 4452 LDADD /LOAD AND GO
3116 4447 OSKSKP /DISK SKIP IOT
3117 5316 JMP , -1 /HANG IF NO SKIP
3120 4444 RDSTAT /READ STATUS
3121 1104 TAD K4000 /SHOULD ONLY BE DONE
3122 7640 SEA CLA /JUST DONE FLAG ?
3123 5340 JMP T38E /STATUS ERROR
3124 2135 ISZ TCNTR1 /UPDATE ADDRESS
3125 5330 JMP , +3 /DON'T SET EXTENDED TRACK
3126 2151 ISZ CMREG /YES, SET IT
3127 2136 ISZ TCNTR2
3130 1136 TAD TCNTR2
3131 7650 SNA CLA /IS EXTENDED SET
3132 5310 JMP T38R /NO, CONTINUE
3133 1135 TAD TCNTR1
3134 1172 TAD ENDTRK /ADD IN FUDGE FACTOR
3135 7640 SEA CLA /DONE WITH DISK
3136 5310 JMP T38R /NO, MORE TO GO
3137 5350 JMP T380K /ALL O.K.
3140 1112 T38E, TAD K2525
3141 4427 FIGURE /WORD BY WORD COMPARE OF DATA
3142 5345 JMP , +3 /ERROR, JUST THE STATUS
3143 1167 TAD K5373 /TEXT POINTER
3144 7410 SKP /DATA ERROR
3145 1170 TAD K5300 /STATUS TEXT POINTER
3146 3353 DCA T38T /SETUP
3147 7610 SKP CLA /STATUS ERROR
3150 4437 T380K, NERROR /O.K., TO NEXT TEST
3151 4440 T38DE, ERROR /ERROR, READ DATA
3152 3100 TST38 /SCOPE LOOP POINTER
3153 5300 T38T, 5300 /TEXT POINTER
/
3154 5755 JMP I , +1 /TO NEXT TEST
3155 3200 TST39
/
PAGE
/
/BIG ADDRESSING CHECK!
/IF A DATA ERROR SHOULD HAPPEN TO OCCUR

```

/WITH THE FIRST TWO WORDS OF THE BUFFER, YOU
 /SHOULD REALIZE THAT THE PROBLEM COULD BE
 /ADDRESSING.
 /
 /CHECK DISK HEADER WORD WITH READ DATA
 /IF STATUS ERROR OCCURRES THEN CHECK DATA,
 /THE DATA ON THE COMPLETE DISK SHOULD BE 2525 * 5252,
 /HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
 /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS,
 /

3200	7340	TST39,	CLA	CLL	CMA		
3201	3173		DCA		SOFERR		/NO SOFT ERRORS
3202	3135		DCA		TCNTR1		/SETUP LOWER ADDRESS
3203	3136		DCA		TCNTR2		/SETUP EXTENDED
3204	1070		TAD		DRIVNO		/CURRENT DRIVE
3205	1157		TAD		HOMEMA		/CURRENT FIELD
3206	3151		DCA		CMREG		/SETUP COMMAND
3207	1067	T39R,	TAD		BGNBUF		/START OF BUFFER
3210	4451		LDCUR				/LOAD CURRENT
3211	1151		TAD		CMREG		/LAST COMMAND
3212	4450		LDCMD				/LOAD COMMAND
3213	1135		TAD		TCNTR1		/LOWER ADDRESS
3214	4452		LDADD				/LOAD AND GO
3215	4447		DSKSKP				/DISK SKIP IOT
3216	5215		JMP		,-1		/HANG IF NO SKIP
3217	4444		RDSTAT				/READ STATUS
3220	1104		TAD		K4000		/SHOULD ONLY BE DONE
3221	7640		SEA	CLA			/JUST DONE FLAG ?
3222	5237		JMP		T39E		/STATUS ERROR
3223	2135		ISZ		TCNTR1		/UPDATE ADDRESS
3224	5227		JMP		,+3		/DON'T SET EXTENDED TRACK
3225	2151		ISZ		CMREG		/YES, SET IT
3226	2136		ISZ		TCNTR2		
3227	1136		TAD		TCNTR2		
3230	7650		SNA	CLA			/IS EXTENDED SET
3231	5207		JMP		T39R		/NO, CONTINUE
3232	1135		TAD		TCNTR1		
3233	1172		TAD		ENDTRK		/ADD IN FUDGE FACTOR
3234	7640		SEA	CLA			/DONE WITH DISK
3235	5207		JMP		T39R		/NO, MORE TO GO
3236	5247		JMP		T39OK		/ALL O.K.
3237	1112	T39E,	TAD		K2525		
3240	4427		FIGURE				/WORD BY WORD COMPARE OF DATA
3241	5244		JMP		,+3		/ERROR, JUST STATUS
3242	1167		TAD		K5373		/TEXT POINTER
3243	7410		SKP				/ERROR
3244	1170		TAD		K5300		/STATUS ERROR POINTER
3245	3252		DCA		T39T		/SETUP
3246	7610		SKP	CLA			
3247	4437	T39OK,	NERROR				/O.K. TO NEXT TEST
3250	4442	T39DE,	ERROR				/ERROR, READ DATA
3251	3200		TST39				/SCOPE LOOP POINTER
3252	5300	T39T,	5300				/TEXT POINTER

/

/DO A RANDOM READ DATA

/THE DATA ON THE COMPLETE DISK SHOULD BE 2525 * 5252,
 /HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
 /SHOULD EQUAL THE ABSOLUTE DISK ADDRESS,
 /

3253	1106	TST40,	TAD		K7000		
3254	3141		DCA		TCNTR5		/LENGTH OF TIME FOR THIS TEST
3255	4422	T40R,	RANADD				/GET AN ADDRESS FOR SEEK/READ
3256	3137		DCA		TCNTR3		/SAVE IT
3257	7004		RAL				/LINK IS EXTENDED
3260	3140		DCA		TCNTR4		/SAVE IT
3261	1340	T40S,	TAD		TCNTR4		
3262	3151		DCA		CMREG		/SETUP COMMAND
3263	1137		TAD		TCNTR3		
3264	4425		DISKGO				/DISK READ DATA
3265	3300		T40T				/TEXT POINTER
3266	5276		JMP		T40E		/ERROR, SKIP OR STATUS
3267	1112		TAD		K2525		
3270	4427		FIGURE				/WORD BY WORD COMPARE OF DATA
3271	7610		SKP	CLA			/DATA O.K.
3272	5276		JMP		T40E		/DATA ERROR
3273	2141		ISZ		TCNTR5		
3274	5255		JMP		T40R		/LOOP
3275	4437		NERROR				/O.K. TO NEXT TEST
3276	4440	T40E,	ERROR				/ERROR, READ
3277	3253		TST40				/SCOPE LOOP POINTER
3300	0000	T40T,	0000				/TEXT POINTER

/

/RANDOM SEEK THEN WRITE THEN SEEK THEN READ TEST
 /THE DATA WRITTEN IS 2525 * 5252 AND THE TWO
 /FIRST WORDS OF THE SECTOR ARE SET TO THE DISK ADDRESS,
 /

3301	1110	TST41,	TAD		K7700		
3302	3141		DCA		TCNTR5		/PASS COUNTER
3303	4422	T41R,	RANADD				/GENERATE RANDOM NUMBER
3304	0116		AND		K0017		
3305	1107		TAD		K7760		
3306	3160		DCA		RAPCNT		/SAVE COUNTER
3307	4422		RANADD				/RANDOM SEEK DISK ADDRESS
3310	3135		DCA		TCNTR1		/SAVE
3311	7004		RAL				/LINK IS EXTENDED BIT
3312	3136		DCA		TCNTR2		/SAVE
3313	4422		RANADD				/RANDOM SEEK/WRITE DISK ADDRESS
3314	3137		DCA		TCNTR3		/SAVE
3315	7004		RAL				/LINK IS EXTENDED BIT
3316	3140		DCA		TCNTR4		/SAVE IT
3317	1112	T41S,	TAD		K2525		
3320	4430		FILBUF				/FILL BUFFER
3321	1140		TAD		TCNTR4		/GET EXTENDED BIT
3322	1070		TAD		DRIVNO		/GET DRIVE NUMBER
3323	3464		DCA	I	XHITRK		/DISK ADDRESS WORD IN BUFFER
3324	1137		TAD		TCNTR3		/LOWER DISK ADDRESS
3325	3463		DCA	I	XLOTRK		/DISK ADDRESS WORD IN BUFFER
3326	1136		TAD		TCNTR2		/GET EXTENDED BIT
3327	3151		DCA		CMREG		/SETUP COMMAND
3330	1135		TAD		TCNTR1		/DISK ADDRESS

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3331 4423 SEFK /SEEK ONLY
3332 3372 T41T /TEXT POINTER
3333 5370 JMP T41E /ERROR SKIP OR STATUS
3334 1140 TAD TCNTR4 /EXTENDED BIT
3335 1104 TAD K4000 /FUNCTION WRITE DATA
3336 3151 DCA CMREG /SETUP COMMAND
3337 1137 TAD TCNTR3 /DISK ADDRESS
3340 4425 DISKGO /DISK WRITE DATA
3341 3372 T41T /TEXT POINTER
3342 5370 JMP T41E /ERROR SKIP OR STATUS
3343 1136 TAD TCNTR2 /GET EXTENDED BIT
3344 3151 DCA CMREG /SETUP COMMAND REGISTER
3345 1135 TAD TCNTR1 /GET DISK ADDRESS
3346 4423 SEEK /GO SEEK ONLY
3347 3372 T41T /TEXT POINTER
3350 5370 JMP T41E /ERROR, SEEK SKIP OR STATUS
3351 1140 TAD TCNTR4 /GET EXTENDED BIT
3352 3151 DCA CMREG /SETUP READ DATA COMMAND
3353 1137 TAD TCNTR3 /DISK ADDRESS
3354 4425 DISKGO /DISK READ DATA
3355 3372 T41T /TEXT POINTER
3356 5370 JMP T41E /ERROR, SKIP OR STATUS
3357 1112 TAD K2525
3360 4427 FIGURE /WORD BY WORD COMPARE OF DATA
3361 7610 SKP CLA /DATA O.K.
3362 5370 JMP T41E /DATA ERROR
3363 2160 ISB RAPCNT /COUNT TO SAME TRACKS
3364 5317 JMP T41S /REPEAT
3365 2141 ISB TCNTR5 /PASS COUNTER
3366 5303 JMP T41R /LOOP
3367 4437 NERROR /O.K. TO NEXT TEST
3370 4440 T41E, ERROR /ERROR
3371 3301 T41T, TST41 /SCOPE LOOP POINTER
3372 5373 T41T, 5373 /TEXT POINTER
/
3373 5774 JMP I ,+1 /TO NEXT TEST
3374 3400 TST42
/
PAGE
/
/VERIFY A RECALIBRATE THEN A RANDOM WRITE DATA,
/THEN A RECALIBRATE THEN RANDOM READ DATA.
/THE DATA PATTERN WRITTEN IS 2525 * 5252 AND
/THE FIRST TWO WORDS OF EVERY SECTOR
/SHOULD EQUAL THE ABSOLUTE DISK ADDRESS,
/
3400 1110 TST42, TAD K7700
3401 3141 DCA TCNTR5 /PASS COUNTER
3402 4422 T42R, RANADD /RANDOM DISK ADDRESS
3403 3135 DCA TCNTR1 /SAVE
3404 7004 RAL /LINK IS EXTENDED BIT
3405 3136 DCA TCNTR2 /SAVE
3406 1112 T42S, TAD K2525
3407 4430 FILBUF /FILL BUFFER
3410 1136 TAD TCNTR2 /GET EXTENDED BIT

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3411 1070 TAD DRIVNO /GET DRIVE NUMBER
3412 3464 DCA I XHITRK /DISK ADDRESS WORD IN BUFFER
3413 1135 TAD TCNTR1 /LOWER DISK ADDRESS
3414 3463 DCA I XLOTRK /DISK ADDRESS WORD IN BUFFER
3415 4424 RECAL /RESTORE DRIVE
3416 3451 T42T /TEXT POINTER
3417 5247 JMP T42E /ERROR SKIP OR STATUS
3420 1136 TAD TCNTR2 /EXTENDED BIT
3421 1104 TAD K4000 /FUNCTION WRITE DATA
3422 3151 DCA CMREG /SETUP COMMAND
3423 1135 TAD TCNTR1 /DISK ADDRESS
3424 4425 DISKGO /DISK WRITE DATA
3425 3451 T42T /TEXT POINTER
3426 5247 JMP T42E /ERROR SKIP OR STATUS
3427 4424 RECAL /RESTORE DRIVE
3430 3451 T42T /TEXT POINTER
3431 5247 JMP T42E /ERROR, SKIP OR STATUS
3432 1136 TAD TCNTR2 /GET EXTENDED BIT
3433 3151 DCA CMREG /SETUP READ DATA COMMAND
3434 1135 TAD TCNTR1 /DISK ADDRESS
3435 4425 DISKGO /DISK READ DATA
3436 3451 T42T /TEXT POINTER
3437 5247 JMP T42E /ERROR, SKIP OR STATUS
3440 1112 TAD K2525
3441 4427 FIGURE /WORD BY WORD COMPARE OF DATA
3442 7610 SKP CLA /DATA O.K.
3443 5247 JMP T42E /DATA ERROR
3444 2141 ISB TCNTR5 /PASS COUNTER
3445 5202 JMP T42R /LOOP
3446 4437 NERROR /O.K. TO NEXT TEST
3447 4440 T42E, ERROR /ERROR
3450 3400 T42T, TST42 /SCOPE LOOP POINTER
3451 5373 T42T, 5373 /TEXT POINTER
/
/SINGLE DRIVE VIBRATION TEST
/
/TRY TO CAUSE CYLINDER ADDRESS ERRORS BY
/DOING A FEW RANDOM SEEKS THEN A READ DATA.
/
3452 1336 TST43, TAD TIMSTP
3453 3141 DCA TCNTR5 /SETUP PASS COUNTER
3454 4431 T43R1, KILBUF /CLEAR BUFFER
3455 4422 RANADD /GET RANDOM NUMBER
3456 0117 AND K0037
3457 1122 TAD K7740
3460 3140 DCA TCNTR4 /SETUP COUNTER FOR SEEKS
3461 4422 T43R2, RANADD /GET RANDOM SEEK ADDRESS
3462 3137 DCA TCNTR3 /SAVE I1
3463 7004 RAL /LINK IS EXTENDED BIT
3464 3136 DCA TCNTR2 /SAVE I1
3465 1136 TAD TCNTR2
3466 3151 DCA CMREG /SETUP COMMAND
3467 1137 TAD TCNTR3
3470 4423 SEEK /SEEK ONLY A RANDOM TRACK
3471 3514 T43T /TEXT POINTER

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3472 5312      JMP      T43E      /ERROR, SKIP OR STATUS
3473 2140      ISZ     TCNTR4  /COUNT NUMBER TO DO
3474 5261      JMP      T43R2
3475 1136      TAD     TCNTR2
3476 3151      DCA     CMREG      /SETUP FOR READ DATA
3477 1137      TAD     TCNTR3
3500 4425      DISKGO  /LOAD AND GO READ DATA
3501 3514      T43T   /TEXT POINTER
3502 5312      JMP      T43E      /ERROR SKIP OR STATUS
3503 1112      TAD     K2525
3504 4427      FIGURE  /CHECK DATA READ
3505 7610      SKP CLA /ALL 0,K,
3506 5312      JMP      T43E      /ERROR, DATA
3507 2141      ISZ     TCNTR5
3510 5254      JMP      T43R1
3511 4437      NERROR  /MORE TO TEST
3512 4440      T43E,  ERROR  /P,K, TO NEXT TEST
3513 3452      TST43  /ERROR, SKIP, STATUS, OR DATA
3514 0000      T43T,  0000  /SCOPE LOOP POINTER
                       /TEXT POINTER
/
/CHECK DISK HEADER WORDS WITH READ DATA
/IF STATUS ERROR OCCURRES THEN CHECK DATA.
/THE DATA ON THE COMPLETE DISK SHOULD BE 2525 + 5252,
/HOWEVER, THE TWO FIRST WORDS OF EVERY SECTOR
/SHOULD EQUAL THE ABSOLUTE DISK ADDRESS,
/
3515 7340      TST44,  CLA CLL CMA
3516 3173      DCA     SOFERR      /SETUP CRC ERROR POINTER
3517 3135      DCA     TCNTR1     /SETUP LOWER ADDRESS
3520 3136      DCA     TCNTR2     /SETUP EXTENDED
3521 1070      TAD     DRIVNO     /CURRENT DRIVE
3522 1157      TAD     HOMEEMA  /CURRENT FIELD
3523 3151      DCA     CMREG     /SETUP COMMAND
3524 1067      T44R,  TAD     BGNBUF  /START OF BUFFER
3525 4451      LDCUR   /LOAD CURRENT ADDRESS
3526 1151      TAD     CMREG     /LAST COMMAND ISSUED
3527 4450      LDCMD   /LOAD COMMAND
3530 1135      TAD     TCNTR1     /LOWER ADDRESS
3531 4452      LDADD   /LOAD AND GO
3532 4447      DSKSKP  /DISK SKIP IOT
3533 5332      JMP      ,-1     /HANG IF NO SKIP
3534 4444      RDSTAT  /READ STATUS
3535 1104      TAD     K4000   /SHOULD ONLY BE DONE
3536 7640      TIMSTP, SZA CLA /JUST DONE FLAG ?
3537 5354      JMP      T44E      /STATUS ERROR
3540 2135      ISZ     TCNTR1     /UPDATE ADDRESS
3541 5344      JMP      ,+3     /DON'T SET EXTENDED TRACK
3542 2151      ISZ     CMREG     /YES, SET IT
3543 2136      ISZ     TCNTR2
3544 1136      TAD     TCNTR2
3545 7650      SNA CLA  /IS EXTENDED SET
3546 5324      JMP      T44R      /NO, CONTINUE
3547 1135      TAD     TCNTR1
3550 1172      TAD     ENDTRK  /ADD IN FUDGE FACTOR
3551 7640      SEA CLA  /DONE WITH DISK

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3552 5324      JMP      T44R      /NO, MORE TO GO
3553 5364      JMP      T440K   /ALL 0,K,
3554 1112      T44E,  TAD     K2525
3555 4427      FIGURE  /WORD BY WORD COMPARE OF DATA
3556 5361      JMP      ,+3     /ERROR, JUST STATUS
3557 1167      TAD     K5373   /TEXT POINTER
3560 7410      SKP     /ERROR
3561 1170      TAD     K5300   /STATUS ERROR POINTER
3562 3367      DCA     T44T     /SETUP
3563 7610      SKP CLA
3564 4437      T440K, NERROR  /0,K, TO NEXT TEST
3565 4440      ERROR  /ERROR, READ DATA
3566 3515      TST44  /SCOPE LOOP POINTER
3567 5300      T44T,  5300  /TEXT POINTER
/
3570 5771      JMP I    ,+1     /TO NEXT TEST
3571 3600      TST45
/
PAGE
/
/VERIFY THAT WRITING ON A TRACK DOES NOT AFFECT
/AN ADJACENT TRACK, THE TEST SEQUENCE IS AS FOLLOWS:
/WRITE TRACKS 00000-00100-00040 THEN READ AND CHECK
/TRACKS 00040-00000-00100, WRITE TRACKS 00020-00120-00060
/THEN READ AND CHECK TRACKS 00060-00020-00120, ETC,
/THE CENTER TRACK IS SET TO A DATA PATTERN OF
/2525 + 5252, THE LOWER AND UPPER TRACKS ARE
/SET TO A DATA PATTERN OF 5252 + 2525, THE FIRST TWO
/WORDS OF EVERY SECTOR ARE SET TO THE ABSOLUTE
/DISK ADDRESS,
/
3600 1012      TST45,  TAD     K0020  /GET STARTING POINTER
3601 3135      DCA     TCNTR1  /SAVE IT
3602 1350      TAD     K7156
3603 3141      DCA     TCNTR5  /COUNTER FOR TRACKS TO DO
3604 7346      T45SC,  CLA CLL CMA RTL
3605 3140      DCA     TCNTR4  /THREE TRACK COUNTER POINTER
3606 1135      TAD     TCNTR1
3607 3137      DCA     TCNTR3
3610 1112      TAD     K2525  /WRITE CENTER TRACK FIRST
3611 5222      JMP      T45A1  /DATA PATTERN FOR CENTER TRACK
3612 1143      T45R1,  TAD     TCNTR4  /GO WRITE CENTER TRACK
3613 7110      CLL RAR  /GET POINTER
3614 7630      SEL CLA  /WRITE UPPER OR LOWER????
3615 1122      TAD     K7740  /DO LOWER
3616 1012      TAD     K0020
3617 1135      TAD     TCNTR1
3620 3137      DCA     TCNTR3  /REDUCE OR UPDATE
3621 1113      TAD     K5252  /SAVE TRACK TO DO
3622 4430      T45A1,  FILBUF  /USE COMPLEMENT OF CENTER TRACK
3623 1107      TAD     K7760  /FILL BUFFER WITH DATA
3624 3136      DCA     TCNTR2  /GET SECTOR COUNTER POINTER
3625 3142      DCA     TCNTR6  /SETUP COUNTER
3626 1142      T45R2,  TAD     TCNTR6  /START WITH 0
3627 0116      AND     K0017  /GET SECTOR POINTER
                       /MASK SECTORS

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3630 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
3631 1137 TAD TCNTR3 /GET DISK ADDRESS
3632 7104 CLL RAL /PUT EXTENDED BIT IN LINK
3633 0107 AND K7760
3634 1463 TAD I XLOTRK /ADD IN SECTORS
3635 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
3636 7630 S2L CLA /SET EXTENDED BIT????
3637 7001 IAC /YES!!!
3640 1070 TAD DRIVNO /ADD IN CURRENT DRIVE
3641 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
3642 1464 TAD I XHITRK /GET EXTENDED BIT
3643 1104 TAD K4000 /FUNCTION WRITE DATA
3644 3151 DCA CMREG /SETUP COMMAND REGISTER POINTER
3645 1463 TAD I XLOTRK /GET CYL., SURFACE, AND SECTOR
3646 4425 DISKGO /WRITE ALL
3647 3745 T45T /TEXT POINTER
3650 5343 JMP T45E /ERROR, WRITE SKIP OR STATUS
3651 1142 TAD TCNTR6
3652 1074 TAD K0003 /UPDATE SECTOR POINTER
3653 3142 DCA TCNTR6
3654 2136 ISZ TCNTR2 /UPDATE SECTOR COUNTER
3655 5226 JMP T45R2 /DO REST OF TRACK
3656 2140 ISZ TCNTR4 /UPDATE TRACK COUNTER
3657 5212 JMP T45R1 /DO OTHERS

3660 7340 CLA CLL CHA
3661 3145 DCA CRREG1 /SETUP FIRST TIME POINTER
3662 7346 CLA CLL CHA RTL
3663 3140 DCA TCNTR4 /TRACK COUNTER POINTER
3664 1135 TAD TCNTR1
3665 3137 DCA TCNTR3 /SETUP FOR READ CENTER FIRST
3666 5276 JMP T45A2 /READ AND CHECK CENTER TRACK
3667 1140 T45R3, TAD TCNTR4 /POINTER
3670 7110 CLL RAR
3671 7630 S2L CLA /CHECK UPPER OR LOWER
3672 1122 TAD K7740 /CHECK LOWER
3673 1012 TAD K0020
3674 1135 TAD TCNTR1 /REDUCE OR UPDATE
3675 3137 DCA TCNTR3 /SAVE THE TRACK TO READ
3676 1107 T45A2, TAD K7760 /AMOUNT OF SURFACE SECTORS
3677 3136 DCA TCNTR2 /SETUP SECTOR COUNTER
3700 3142 DCA TCNTR6 /START WITH 0
3701 1137 T45R4, TAD TCNTR3 /GET DISK ADDRESS
3702 7104 CLL RAL /PUT EXTENDED BIT IN LINK
3703 0107 AND K7760
3704 3146 DCA CRREG2 /SAVE RESULTS
3705 7630 S2L CLA /SET EXTENDED BIT
3706 7001 IAC /YES
3707 3151 DCA CMREG /SETUP COMMAND FOR READ DATA
3710 1142 TAD TCNTR6 /GET SECTOR POINTER
3711 0116 AND K0017 /MASK
3712 1146 TAD CRREG2 /ADD IN TRACK
3713 4425 DISKGO /READ DATA
3714 3745 T45T /TEXT POINTER
3715 5343 JMP T45E /ERROR, READ SKIP OR STATUS

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3716 1145 TAD CRREG1 /GET FIRST TIME POINTER
3717 7650 SNA CLA /FIRST TIME????
3720 1112 TAD K2525 /NO
3721 1112 TAD K2525
3722 4427 FIGURE /CHECK DATA READ
3723 7610 SKP CLA /DATA ALL O.K.
3724 5343 JMP T45E /ERROR, DATA
3725 1142 TAD TCNTR6
3726 1076 TAD K0005 /UPDATE SECTOR POINTER
3727 3142 DCA TCNTR6
3730 2136 ISZ TCNTR2 /UPDATE SECTOR COUNTER
3731 5301 JMP T45R4 /DO REST OF SURFACE
3732 3145 DCA CRREG1 /CLEAR FIRST TIME FLAG
3733 2140 ISZ TCNTR4 /UPDATE TRACK COUNTER
3734 5267 JMP T45R3 /DO OTHER TRACKS
3735 1135 TAD TCNTR1 /GET CURRENT TRACK POINTER
3736 1011 TAD K0010 /UPDATE
3737 3135 DCA TCNTR1 /SAVE IT
3740 2141 ISZ TCNTR5 /UPDATE TOTAL AMOUNT TO DO
3741 5204 JMP T45SC /MORE TO DO
3742 4437 NERROR /ALL O.K. TO END OF TEST
3743 4440 T45E, ERROR /ERROR, TRACKS AFFECTED
3744 3600 T45T, TST45 /SCOPE LOOP POINTER
3745 0200 /MODIFIED TEXT POINTER

3746 5747 JMP I ,+1 /TO END OF TEST
3747 4040 ENDTST

3750 7156 K7156, 7156
/
/ PAGE
/
/PROGRAM TO AID IN HEAD ALIGNMENT,
/GET TWO SEPARATE SEEK ADDRESS FROM
/THE SWITCH REGISTER AND SEEK ONLY BETWEEN
/THEM, SECOND ADDRESS MAY BE CHANGED AT ANY TIME,
/
4000 7604 SHSEK, LAS /GET FIRST ADDRESS
4001 3135 DCA TCNTR1 /SAVE IT
4002 7402 HEDHLT, HLT /WAIT FOR SECOND ADDRESS
4003 7604 RESEK, LAS /GET SECOND ADDRESS
4004 3136 DCA TCNTR2 /SAVE IT
4005 1136 TAD TCNTR2
4006 0100 AND K0007 /MASK DRIVE * EXT. BIT
4007 1103 TAD K3000 /GET SEEK FUNCTION
4010 4450 LDCMD /LOAD COMMAND REGISTER
4011 1136 TAD TCNTR2
4012 0107 AND K7760 /MASK OFF CYLINDER * SURFACE
4013 4452 LDADD /GO SEEK ONLY
4014 4447 DSKSKP /SKIP ON DONE
4015 5214 JMP , -1
4016 4453 CLRALL /CLEAR STATUS
4017 4444 RDSTAT /READ STATUS
4020 7642 SZA CLA /DRIVE DONE?
4021 5216 JMP , -3 /NO, WAIT

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4022 1135 TAD TCNTR1 /GET FIRST ADDRESS
4023 0107 AND K0007 /MASK DRIVE * EXT, BIT
4024 1103 TAD K3000 /GET SEEK FUNCTION
4025 4452 LDCMD /LOAD COMMAND REGISTER
4026 1135 TAD TCNTR1
4027 0107 AND K7760 /MASK OFF CYLINDER AND SURFACE
4030 4452 LDADD /LOAD AND GO SEEK
4031 4447 DSKSKP /WAIT FOR DONE
4032 5231 JMP ,-1
4033 4453 CLRALL /CLEAR STATUS
4034 4444 RDSTAT /READ STATUS
4035 7640 SZA CLA /DRIVE DONE?
4036 5233 JMP ,-3 /NO, WAIT
4037 5203 JMP RESEK /CHECK FOR NEW ADDRESS

/
/CONTAINS END OF TEST TYPE OUT AND A CHECK ON SWR3=1
/WHICH IS CONTINUE TO TEST CURRENT DISK,
/ALSO IF THERE IS MORE THAN 1 DISK ON THE SYSTEM
/AND THEY HAVE ALL RUN THE COMPLETE TEST, RUN OVERLAP
/SEEKS AND OVERLAP SEEKS, WRITE, AND READ DATA ON ALL
/DRIVES
/
4040 7604 ENDTST, LAS
4041 0016 AND K0400 /MASK SWITCH 3
4042 7640 SZA CLA /LOOP ON SAME DISK
4043 5264 JMP SAMDSK /YES
4044 1071 TAD DRIVSV
4045 7450 SNA /WAS THERE AND EXTRA
4046 5264 JMP SAMDSK /NO, ONLY DISK 0
4047 7104 CLL RAL
4050 7041 CIA
4051 1070 TAD DRIVNO /CURRENT DRIVE
4052 7650 SNA CLA /START OVER YET
4053 5260 JMP TSTSEK /YES, TEST OVERLAP SEEKS
4054 7326 CLA CLL CML RTL
4055 1070 TAD DRIVNO
4056 3070 DCA DRIVNO /UPDATE DRIVE NUMBER
4057 5273 JMP NEXDSK /TEST NEXT DISK DRIVE
4060 4765 TSTSEK, JMS I XLAP /PERFORM OVERLAP SEEKS
4061 4764 JMS I XGRONK /PERFORM OVERLAP SEEKS
4062 4766 JMS I XOVRRD /OVERLAP SEEKS * WRITES * READS
4063 3070 DCA DRIVNO /SETUP DRIVE NO.
4064 4462 SAMDSK, CRLF
4065 4457 PRNTER /PRINT PASS COMPLETE
4066 6740 TEXEND
4067 7604 LAS
4070 0075 AND K0004
4071 7640 SZA CLA /SWITCH 9 SET?
4072 7402 ENDWLT, HLT /YES, STOP PROGRAM
4073 7301 NEXDSK, CLA CLL IAC
4074 4453 CLRALL /DCLR
4075 3132 DCA REG0
4076 3133 DCA REG1
4077 5700 JMP I ,+1 /LOOP ON PROGRAM
4100 0235 TST0

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/
/THE FOLLOWING IS A ROUTINE TO CHECK THE WRITE PROTECT
/FUNCTION WHEN IT IS MANUALLY SET BY THE OPERATOR,
/NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST.
/
4101 7604 MANPRO, LAS /GET THE SWITCHES
4102 7104 CLL RAL
4103 0077 AND K0006 /MASK DRIVE NUMBER
4104 3070 DCA DRIVNO /SAVE DRIVE NUMBER
4105 1110 TAD K7700
4106 3133 DCA REG1 /SETUP PASS COUNTER
4107 3132 DCA REG0 /SETUP FLAG POINTER
4110 1112 TAD K2525 /DATA PATTERN TO WRITE
4111 4430 FILBUF /FILL OUTBOUND BUFFER
4112 1070 TAD DRIVNO
4113 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
4114 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
4115 1114 TAD K5000 /WRITE ALL FUNCTION
4116 3151 DCA CHREG /SETUP COMMAND
4117 4425 DISKGO /WRITE ALL TO SECTOR 0
4120 4161 THPROT /TEXT POINTER
4121 5357 JMP MPERR /ERROR, STATUS
4122 7402 MPHLT1, HLT /HALT AND WAIT FOR OPERATOR

/
4123 4431 MPR1, KILBUF /CLEAR OUTBOUND BUFFER
4124 1070 TAD DRIVNO
4125 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
4126 1114 TAD K5000 /WRITE ALL FUNCTION
4127 3151 DCA CHREG /SETUP COMMAND REGISTER
4130 4425 DISKGO /WRITE ALL TO SECTOR 0
4131 4161 THPROT /TEXT POINTER
4132 7000 NOP
4133 7326 CLA CLL CML RTL
4134 1012 TAD K0020 /MAKE EXPECTED STATUS
4135 3144 DCA DOREG2 /SETUP COMPARE REGISTER
4136 1170 TAD K5300
4137 3361 DCA THPROT /SETUP TEXT POINTER
4140 1147 TAD STREG /GET STATUS READ
4141 4442 ACCMP1 /CHECK RESULTS
4142 7610 SKP CLA /STATUS O.K.
4143 5357 JMP MPERR /ERROR, WRITE PROTECT
4144 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
4145 4453 CLRALL /CLEAR CONTROL
4146 4431 KILBUF /CLEAR DATA BUFFER
4147 1017 TAD K1000 /FUNCTION READ ALL
4150 3151 DCA CHREG /SETUP COMMAND
4151 4425 DISKGO /READ ALL SECTOR 0
4152 4161 THPROT /TEXT POINTER
4153 5357 JMP MPERR /ERROR
4154 1112 TAD K2525 /EXPECTED PATTERN
4155 4427 FIGURE /CHECK DATA READ
4156 4437 NERROR /ALL O.K, GO LOOP 64 TIMES
4157 4440 MPERR, ERROR /ERROR, WRITE PROTECT
4160 4123 MPR1
4161 0000 THPROT, 0000 /TEXT POINTER

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/ PAL10 V142 12-DEC-74 8:48 PAGE 1-46
4162 7402 MPHLT2, HLT /SUCCESSFUL WRITE PROTECT
4163 5301 JMP MANPRO /REPEAT
/
4164 4265 XGRONK, GRONK
4165 4200 XLAP, OVLAP
4166 4400 XOVRRD, OVRRED
/
4202 PAGE
/
/Routine to DO OVERLAP SEEKS ON EXISTING DRIVES
/AFTER ALL HAVE RUN THE COMPLETE DIAGNOSTIC
/
4200 0000 OVLAP, 0
4201 1104 TAD K4000
4202 3141 DCA TCNTR5 /PASS COUNTER
4203 1071 OVR1, TAD DRIVSV /GET AMOUNT OF DRIVES
4204 7040 CMA
4205 3147 DCA TCNTR4 /SETUP COUNTER
4206 3137 DCA TCNTR3 /START WITH DRIVE 0
4207 1137 OVR2, TAD TCNTR3
4210 7104 CLL RAL
4211 3070 DCA DRIVNO /DISK NO. POINTER
4212 1137 TAD TCNTR3
4213 4422 RANADD /SELECT A RANDOM ADDRESS
4214 4420 DSKOUT /SEND DISK OUT
4215 4453 CLRALL /CLEAR STATUS
4216 2137 ISZ TCNTR3 /UPDATE DRIVE NUMBER
4217 2140 ISZ TCNTR4 /UPDATE DISK COUNTER
4220 5207 JMP OVR2 /DO ALL EXISTING DISKS
4221 3137 DCA TCNTR3 /CLEAR FOR 0
4222 1071 TAD DRIVSV /GET AMOUNT OF DRIVES
4223 7040 CMA
4224 3140 DCA TCNTR4 /SETUP COUNTER
4225 1137 OVR3, TAD TCNTR3
4226 4421 DSKIN /CHECK FOR DRIVE DONE
4227 5232 JMP NOTDON /DRIVE NOT DONE
4230 5240 JMP OVR0K /DRIVE DONE AND NO ERRORS
4231 5261 JMP OVRERR /DRIVE ERRORS
4232 2137 NOTDON, ISZ TCNTR3 /UPDATE DISK NUMBER
4233 1137 TAD TCNTR3
4234 1140 TAD TCNTR4
4235 7640 SZA CLA /LAST EXISTING DRIVE
4236 5225 JMP OVR3 /NO, DO REST
4237 5221 JMP OVR3 -4 /YES, RESET
4240 7340 OVR0K, CLA CLL CMA
4241 3140 DCA TCNTR4
4242 2141 ISZ TCNTR5 /UPDATE PASS COUNTER, DONE ?
4243 5207 JMP OVR2 /NO, SEND OUT
4244 3137 DCA TCNTR3 /SET FOR 0
4245 1071 TAD DRIVSV
4246 7040 CMA
4247 3147 DCA TCNTR4
4250 1137 ALLBAK, TAD TCNTR3
4251 4421 DSKIN /CHECK FOR DRIVE DONE
4252 5250 JMP ALLBAK /WAIT FOR THIS DRIVE

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/ PAL10 V142 12-DEC-74 8:48 PAGE 1-47
4253 7610 SKP CLA /WAIT FOR NEXT
4254 5261 JMP OVRERR /DRIVE ERRORS
4255 2137 ISZ TCNTR3
4256 2140 ISZ TCNTR4 /LAST DRIVE HOME YET
4257 5250 JMP ALLBAK /WAIT FOR ALL
4260 4437 NERROR /O.K. TO NEXT
4261 4440 OVRERR, ERROR /ERROR, OVERLAP SEEKS
4262 4201 OVLAP +1 /SCOPE LOOP POINTER
4263 5300 /TEXT POINTER
4264 5600 JMP I OVLAP /TO NEXT TEST
/
/SYSTEM VIBRATION TEST
/
/Routine to DO OVERLAP SEEKS AND
/REALLY SHAKE THE DRIVES
/ALL DRIVES PERFORM "SEEK ONLY" BETWEEN TRACK
/312 AND SOME RANDOM TRACK.
/
4265 0000 GRONK, 0
4266 1105 TAD K6000
4267 3141 DCA TCNTR5 /CLEAR PASS COUNTER
4270 1071 TAD DRIVSV /AMOUNT OF DRIVES
4271 7040 CMA
4272 3140 DCA TCNTR4 /SETUP POINTER
4273 3137 DCA TCNTR3 /START WITH 0
4274 1137 GRNKR1, TAD TCNTR3
4275 7104 CLL RAL
4276 3070 DCA DRIVNO /SETUP DRIVE NO. POINTER
4277 1137 TAD TCNTR3
4300 1777 TAD DSKPOT /GET ADDRESS POINTER
4301 3136 DCA TCNTR2 /SAVE IT
4302 1536 TAD I TCNTR2 /GET LAST VALUE
4303 7110 CLL RAR
4304 7630 SZA CLA /EXT. BIT SET?
4305 5311 JMP ,+4 /YES, GO TO OTHER THAN 312
4306 1066 TAD TRK212
4307 7121 CLL CML IAC /SET INDICATORS
4310 5315 JMP ,+5 /SAVE AND SEND DRIVE OUT
4311 1137 TAD TCNTR3 /GET SAVE POINTER
4312 4422 RANADD /GET RANDOM ADDRESS
4313 0370 AND A7776 /CLEAR EXT. BIT
4314 7100 CLL
4315 3536 DCA I TCNTR2 /RESET IT
4316 1536 TAD I TCNTR2 /GET ADDRESS
4317 4420 DSKOUT /SEND DRIVE OUT
4320 4453 CLRALL /CLEAR STATUS
4321 2137 ISZ TCNTR3 /UPDATE POINTER
4322 2140 ISZ TCNTR4 /UPDATE COUNTER
4323 5274 JMP GRNKR1 /MORE TO SEND OUT
4324 3137 DCA TCNTR3 /START CHECK AT 0
4325 1071 TAD DRIVSV
4326 7040 CMA
4327 3140 DCA TCNTR4 /SETUP AMOUNT COUNTER
4330 1137 GRNKR2, TAD TCNTR3
4331 4421 DSKIN /CHECK FOR DRIVE DONE

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4332 5335      JMP      NTGRNK      /DRIVE NOT DONE
4333 5343      JMP      GRNKOK      /DONE SEND BACK OUT
4334 5364      JMP      GRNKER      /DRIVE ERRORS
          NTGRNK, ISZ TCNTR3      /UPDATE DRIVE NO. POINTER
4336 1140      TAD      TCNTR4
4337 1137      TAD      TCNTR3
4340 7640      SEA CLA      /LAST ONE YET?
4341 5330      JMP      GRNKR2      /NO
4342 5324      JMP      GRNKR2 -4 /YES, RESET POINTER
4343 7340      GRNKOK, CLA CLL CMA
4344 3140      DCA      TCNTR4      /SETUP POINTER
4345 2141      ISZ      TCNTR5      /UPDATE PASS COUNTER
4346 5274      JMP      GRNKR1      /NOT DONE YET
4347 3137      DCA      TCNTR3
4350 1071      TAD      DRIVSV
4351 7040      CMA
4352 3140      DCA      TCNTR4
4353 1137      GRNKR3, TAD TCNTR3
4354 4421      DSKIN      /CHECK FOR DISK DONE
4355 5353      JMP      GRNKR3      /WAIT FOR DRIVE
4356 7610      SKP CLA      /WAIT FOR NEXT ONE
4357 5364      JMP      GRNKER      /DRIVE ERRORS
4360 2137      ISZ      TCNTR3
4361 2140      ISZ      TCNTR4
4362 5353      JMP      GRNKR3      /MORE TO WAIT FOR
4363 4437      NERROR      /O.K. TO NEXT TEST
4364 4440      GRNKER, ERROR /OVERLAP SEEK ERRORS
4365 4266      GRONK +1 /SCOPE LOOP POINTER
4366 5300      5300      /TEXT POINTER
4367 5665      JMP I GRONK      /EXIT

/
4370 7776      /A7776, 7776
/
4377 4535      /PAGE
4400 4400      /
/ROUTINE TO PERFORM RANDOM OVERLAP SEEKS, WRITES AND,
/READS ON ALL EXISTING DRIVES AFTER THEY HAVE RUN THE
/COMPLETE DIAGNOSTIC.
/
4400 0000      OVRRED, 0
4401 7330      CLA CLL CML RAR
4402 3141      DCA      TCNTR5      /PASS COUNTER
4403 1071      OVRRD1, TAD DRIVSV /GET AMOUNT OF DRIVES
4404 7040      CMA
4405 3140      DCA      TCNTR4      /SETUP COUNTER
4406 3137      DCA      TCNTR3      /START WITH DRIVE 0
4407 1137      OVRRD2, TAD TCNTR3
4410 7104      CLL RAL
4411 3070      DCA      DRIVNO      /SETUP DRIVE POINTER
4412 1137      TAD      TCNTR3
4413 4422      RANADD      /SELECT A RANDOM ADDRESS
4414 4420      DSKOUT      /SEND DISK OUT
4415 4453      CLRALL      /CLEAR STATUS
4416 2137      ISZ      TCNTR3      /UPDATE DISK NUMBER

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4417 2140      ISZ      TCNTR4      /UPDATE DISK COUNTER
4420 9207      JMP      OVRRD2      /DO ALL EXISTING DISKS
4421 3137      DCA      TCNTR3      /CLEAR FOR W
4422 1071      TAD      DRIVSV      /GET AMOUNT OF DRIVES
4423 7040      CMA
4424 3140      DCA      TCNTR4      /SETUP COUNTER
4425 1137      OVRRD3, TAD TCNTR3
4426 4421      DSKIN      /CHECK THIS DRIVE
4427 9234      JMP      CHKNEK      /CHECK FOR NEXT DRIVE
4430 9242      JMP      OVRDOK      /DONE AND NO ERRORS
4431 1170      POLERR, TAD K5300
4432 3332      DCA      TOVRDT      /SETUP TEXT POINTER
4433 5330      JMP      OVRDR      /ERRORS
4434 2137      CHKNEK, ISZ TCNTR3 /UPDATE DISK NUMBER
4435 1137      TAD      TCNTR3
4436 1140      TAD      TCNTR4
4437 7640      SEA CLA      /LAST EXISTING DRIVE
4440 5225      JMP      OVRRD3      /NO, DO REST
4441 5221      JMP      OVRRD3 -4 /YES, RESET
4442 1335      OVRDOK, TAD DSKPOT /GET STORAGE POINTER
4443 1137      TAD      TCNTR3      /ADD IN DRIVE NUMBER
4444 3334      DCA      DSKADD      /MAKE ADDRESS
4445 1734      TAD I DSKADD      /GET DISK ADDRESS
4446 3136      DCA      TCNTR2      /SAVE IT
4447 1334      TAD      DSKADD      /GET POINTER
4450 1075      TAD      K0004      /ADD IN FUDGE FACTOR
4451 3334      DCA      DSKADD      /MAKE ADDRESS
4452 1137      TAD      TCNTR3      /GET DISK NUMBER POINTER
4453 7104      CLL RAL
4454 3070      DCA      DRIVNO      /MAKE DISK NUMBER
4455 1113      TAD      K5252      /GET DATA PATTERN TO USE
4456 4430      FILBUF      /FILL DATA BUFFER
4457 1734      TAD I DSKADD      /GET EXTENDED BIT
4460 1070      TAD      DRIVNO      /ADD IN DRIVE NUMBER
4461 3464      DCA I XHITRK      /SETUP ADDRESS WORD IN BUFFER
4462 1136      TAD      TCNTR2      /GET CYL., SURFACE, AND SECTOR
4463 3463      DCA I XLOTRK      /SETUP ADDRESS WORD IN BUFFER
4464 1464      TAD I XHITRK      /GET EXTENDED BIT
4465 1104      TAD      K4000      /ADD IN WRITE FUNCTION
4466 3151      DCA      CMREG      /SETUP COMMAND POINTER
4467 1463      TAD I XLOTRK      /GET ADDRESS
4470 4425      DISKGO      /DISK WRITE DATA
4471 4532      TOVRDT      /TEXT POINTER
4472 5330      JMP      OVRDR      /ERROR, WRITE SKIP OR STATUS
4473 4431      KILBUF      /CLEAR DATA BUFFER
4474 1734      TAD I DSKADD      /GET EXTENDED BIT
4475 3151      DCA      CMREG      /SETUP COMMAND REGISTER
4476 1136      TAD      TCNTR2      /GET DISK ADDRESS
4477 4425      DISKGO      /GO, READ DATA
4500 4532      TOVRDT      /TEXT POINTER
4501 5330      JMP      OVRDR      /ERROR
4502 1113      TAD      K5252
4503 4427      FIGURE      /WORD BY WORD COMPARE DATA
4504 7610      SKP CLA      /DATA O.K. CONTINUE
4505 5330      JMP      OVRDR      /DATA ERROR

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4506 1137 TAD TCNTR3
4507 4422 RANADD /GENERATE RANDOM ADDRESS
4510 4423 DSKOUT /SEND DRIVE BACK OUT
4511 2141 ISZ TCNTR5 /UPDATE PASS COUNTER, DONE ?
4512 5234 JMP CHKNEK /CHECK FOR NEXT DRIVE
4513 3137 DCA TCNTR3 /SET FOR 0
4514 1071 TAD DRIVSV
4515 7040 CMA
4516 3140 DCA TCNTR4
4517 1137 REDBAK, TAD TCNTR3
4520 4421 DSKIN /CHECK THIS DRIVE
4521 5317 JMP REDBAK /WAIT FOR DRIVE
4522 7617 SKP CLA /CHECK FOR NEXT
4523 5231 JMP POLERR /ERROR
4524 2137 ISZ TCNTR3
4525 2140 ISZ TCNTR4 /LAST DRIVE HOME YET
4526 5317 JMP REDBAK /WAIT FOR ALL
4527 4437 NERROR /D.K. TO NEXT
4530 4440 OVRDER, ERROR /OVERLAP SEEKS + READ DATA
4531 4401 OVRRED +1 /SCOPE LOOP POINTER
4532 5300 TOVRDT, 5300 /TEXT POINTER
4533 5600 JMP I OVRRED /TO NEXT TEST

/
4534 0000 DSKADD, 0
4535 6365 DSKPOT, DSK0A
/
/ROUTINE TO CHECK DRIVE IN AC
/
4536 0000 DIN, 0
4537 7104 CLL RAL /MAKE DRIVE NO.
4540 4458 LDCMD /FIRST SELECT DRIVE
4541 1151 TAD CMREG
4542 1015 TAD K0200 /ENABLE SET DONE BIT
4543 4458 LDCMD /LOAD COMMAND
4544 7332 CLA CLL CML RTR /MAYBE EXPECTED STATUS
4545 3144 DCA GDREG2 /SETUP COMPARE REGISTER
4546 4444 RDSTAT /READ STATUS
4547 4447 DSKSKP /CHECK FOR SKIP
4550 5361 JMP NDIN /CHECK FOR NOT DONE
4551 7330 CLA CLL CML RAR /EXPECTED STATUS
4552 3144 DCA GDREG2 /SETUP COMPARE REGISTER
4553 4444 RDSTAT /READ STATUS
4554 1104 TAD K4000 /ADD IN FUDGE FACTOR
4555 7640 SZA CLA /O.K.???
4556 2336 ISZ DIN /ERROR!!!
4557 2336 ISZ DIN
4560 5736 JMP I DIN /EXIT
4561 1105 NDIN, TAD K6000
4562 7640 SZA CLA /SKIP IF NO ERROR
4563 5356 JMP ,-5 /ERROR EXIT
4564 5736 JMP I DIN /EXIT

/
4600 PAGE
/
/MANUAL FUNCTION TEST

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/LOAD ADDRESS 0201 0R "MANUAL",
/SET SWITCHES TO FUNCTION
/PRESS START
/MACHINE SHOULD HALT
/SET SWITCHES TO DISK ADDRESS
/PRESS START
/MACHINE SHOULD HALT
/SET SWITCHES TO COMPLEMENT DATA PATTERN
/PRESS START
/MACHINE SHOULD HALT
/SET SWITCHES TO 0000
/PRESS START
/IN CASE OF FAILURES USE NORMAL SCOPE SWITCHES
/IF LOOP IS DESIRED USE NORMAL SCOPE SWITCHES
/
4600 7604 MANUAL, LAS
4601 0307 AND K7707 /MASK
4602 3135 DCA TCNTR1 /SAVE FUNCTION
4603 7340 CLA CLL CMA
4604 3132 DCA REG0 /SETUP FOR ONE PASS
4605 6224 RIF /USE CURRENT FIELD
4606 1135 TAD TCNTR1
4607 3135 DCA TCNTR1 /ACTUAL FUNCTION
4610 1135 TAD TCNTR1
4611 0077 AND K0006 /MASK DISK DRIVE
4612 3070 DCA DRIVND /ACTUAL DRIVE
4613 7402 HLT /WAIT FOR DISK ADDR. IN SWITCHES
4614 7604 LAS
4615 3136 DCA TCNTR2 /SAVE DISK ADDRESS
4616 7402 HLT /WAIT FOR COMPLEMENT DATA
4617 7604 LAS
4620 3137 DCA TCNTR3 /SAVE IT
4621 7402 HLT /WAIT FOR OPERATOR TO CONTINUE
4622 1137 TAD TCNTR3
4623 4430 FILBUF /FILL BUFFER WITH DATA
4624 7300 THANS, CLA CLL
4625 1135 TAD TCNTR1 /GET FUNCTION
4626 0106 AND K7000 /MASK
4627 1105 TAD K6000
4630 7630 SZL CLA /HAS IT A READ
4631 7340 CLA CLL CMA /NO, SET A FLAG
4632 3140 DCA TCNTR4 /READ FLAG
4633 1135 TAD TCNTR1 /GET FUNCTION
4634 0106 AND K7000 /MASK
4635 1114 TAD K5000
4636 7640 SZA CLA /HAS IT A SEEK
4637 5247 JMP NTSEK /NOT A SEEK
4640 1135 TAD TCNTR1 /YES
4641 3151 DCA CMREG /SETUP COMMAND
4642 1136 TAD TCNTR2 /DISK ADDRESS
4643 4423 SEEK /SEEK ONLY
4644 4705 THANT /TEXT POINTER
4645 5303 JMP YMANE /ERROR, SKIP OR STATUS
4646 5302 JMP YMANOK /TO HANDLER
4647 1135 NTSEK, TAD TCNTR1 /GET FUNCTION

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4650 0103 AND K0007 /MASK
4651 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
4652 1135 TAD TCNTR1 /FUNCTION
4653 3151 DCA CMREG /SETUP COMMAND
4654 1136 TAD TCNTR2 /DISK ADDRESS
4655 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
4656 1142 TAD TCNTR4 /GET READ FLAG
4657 7650 SNA CLA /HAS IT A READ
4660 4431 KILBUF /YES, CLEAR BUFFER
4661 1136 TAD TCNTR2 /GET DISK ADDRESS
4662 4425 DISKGO /DISK GO
4663 4705 TMANT /TEXT POINTER
4664 5303 JMP TMANE /ERROR
4665 1142 TAD TCNTR4 /GET READ FLAG
4666 7640 SZA CLA /HAS IT A READ
4667 5302 JMP TMANOK /HAS A WRITE, TO HANDLER
4670 1151 TAD CMREG /GET LAST COMMAND
4671 0014 AND K0100 /MASK OUT HALF BIT
4672 7650 SNA CLA /HAS IT HALF BLOCK TRANSFERS
4673 5302 JMP ,+5 /NO, COMPARE WHOLE BLOCK
4674 1137 TAD TCNTR3 /GET GOOD WORD POINTER
4675 4426 HAFCHK /CHECK FOR HALF BLOCK
4676 5302 JMP TMANOK /O.K, NO ERRORS
4677 5303 JMP TMANE /DATA ERROR
4700 1137 TAD TCNTR3 /HAS A READ
4701 4427 FIGURE /WORD BY WORD COMPARE OF DATA
4702 4437 THANDK, NERROR /NO ERRORS
4703 4440 THANE, ERROR /ERROR IN FUNCTION SELECTED
4704 4624 THANS /SCOPE LOOP POINTER
4705 5373 THANT, 5373 /TEXT POINTER
/
4706 5224 / JMP TMANS / LOOP
/
4707 7707 K7707, 7707
/
/Routine to check the write protect function
/when it is set under program control
/NOTE: NO SCOPE LOOPS ARE AVAILABLE FOR THIS TEST
/
4710 7604 AUTPRO, LAS /GET THE SWITCHES
4711 7104 CLL RAL
4712 0077 AND K0006 /MASK DRIVE NUMBER
4713 3070 DCA DRIVNO /SAVE DRIVE NUMBER
4714 7344 CLA CLL CMA RAL
4715 3133 DCA REG1 /SETUP REPEAT POINTER
4716 3132 DCA REG0
4717 1112 TAD K2525 /DATA PATTERN TO WRITE
4720 4435 FILBUF /FILL OUTBOUND BUFFER
4721 1070 TAD DRIVNO
4722 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
4723 3463 DCA I XLOTRK /SETUP ADDRESS WORD IN BUFFER
4724 1114 TAD K5000 /WRITE ALL FUNCTION
4725 3151 DCA CMREG /SETUP COMMAND
4726 4425 DISKGO /WRITE ALL TO SECTOR 0
4727 4775 TAPROT /TEXT POINTER

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4730 5373 JMP APERR /ERROR, STATUS
4731 1102 APR1, TAD K2000 /FUNCTION WRITE PROTECT
4732 1070 TAD DRIVNO /CURRENT DRIVE
4733 4450 LDCMD /LOAD COMMAND REGISTER
4734 4452 LDADD /LOAD AND GO
4735 4444 ROSTAT /READ STATUS REGISTER
4736 7640 SZA CLA /SHOULD BE 0000 ???
4737 5352 JMP APA1 /ERROR, STATUS
4740 4431 KILBUF /CLEAR OUTBOUND BUFFER
4741 1070 TAD DRIVNO
4742 3464 DCA I XHITRK /SETUP ADDRESS WORD IN BUFFER
4743 1114 TAD K5000 /WRITE ALL FUNCTION
4744 3151 DCA CMREG /SETUP COMMAND REGISTER
4745 4425 DISKGO /WRITE ALL TO SECTOR 0
4746 4775 TAPROT /TEXT POINTER
4747 7000 NOP
4750 7326 CLA CLL CML RTL
4751 1012 TAD K0020 /MAKE EXPECTED STATUS
4752 3144 APA1, DCA GDREG2 /SETUP COMPARE REGISTER
4753 1170 TAD K5300
4754 3375 DCA TAPROT /SETUP TEXT POINTER
4755 1147 TAD STREG /GET STATUS READ
4756 4442 ACCMP1 /CHECK RESULTS
4757 7610 SKP CLA /STATUS O.K.
4760 5373 JMP APERR /ERROR, WRITE PROTECT
4761 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
4762 4453 CLRALL /CLEAR CONTROL
4763 1017 TAD K1000 /FUNCTION READ ALL
4764 3151 DCA CMREG /SETUP COMMAND
4765 4425 DISKGO /READ ALL SECTOR 0
4766 4775 TAPROT /TEXT POINTER
4767 5373 JMP APERR /ERROR
4770 1112 TAD K2525 /EXPECTED PATTERN
4771 4427 FIGURE /CHECK DATA READ
4772 4437 NERROR /ALL O.K, DO ONE MORE TIME
4773 4440 APERR, ERROR /ERROR, WRITE PROTECT
4774 4731 APR1
4775 0000 TAPROT, 0000 /TEXT POINTER
4776 7402 APHLT1, HLT /SUCCESSFUL WRITE PROTECT
4777 5310 JMP AUTPRO /REPEAT
/
PAGE
/
/SUBROUTINE FOR "ERRORS," SCOPE LOOPS, AND
/ERROR TYPEOUTS.
/
5000 0000 ERRO, 0
5001 7300 CLA CLL
5002 1600 TAD I ERRO /GET RESTART ADDRESS
5003 3175 DCA RESTRT /STORE
5004 7604 LAS /GET SWITCH 0
5005 7700 SMA CLA /IS IT SCOPE LOOP
5006 5217 JMP ERRA1 /NO, CONTINUE
5007 7604 LAS /GET SWR2
5010 7006 RTL

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5011 7717 SPA CLA /INHIBIT BELL????
5012 5215 JMP ,+3 /YES
5013 1354 TAD K0207
5014 4436 TYPE
5015 1600 TAD I ERRO
5016 5755 JMP I ESCOPE /CHECK FOR BELL
5017 1600 ERR1, TAD I ERRO
5020 3356 DCA RETRN2 /STORE FOR RETURN
5021 2200 ISZ ERRO
5022 7301 CLA CLL IAC
5023 1200 TAD ERRO /NEXT TEST POINTER
5024 3357 DCA INHIBT /STORE FOR SPECIAL RETURN
5025 4462 CRLF
5026 4462 CRLF
5027 1600 TAD I ERRO /GET TEXT POINTER
5030 0102 AND K0007 /MASK 9-11
5031 1365 TAD HEDTAD /MAKE ERROR HEADER TAD
5032 3233 DCA ,+1
5033 7402 HLT /MODIFIED HEADER TAD
5034 3236 DCA ,+2
5035 4457 PRNTER /MODIFIED HEADER POINTER
5036 7402 HLT
5037 4462 CRLF
5040 4457 PRNTER /PRINT PC:
5041 5750 TEXPC
5042 7340 CLA CLL CMA
5043 1200 TAD ERRO /GET PC POINTER
5044 4460 OCTEL /PRINT PC STORED
5045 1600 TAD I ERRO /GET TEXT POINTER
5046 7104 CLL RAL
5047 7420 SNL
5050 5264 JMP NTGD /NOT GD: REGISTER

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5051 3200 DCA ERRO
5052 4457 PRNTER /PRINT GD:
5053 5752 TEXGD
5054 1200 TAD ERRO
5055 7700 SMA CLA /HAS IT A 6 BIT OCTAL BYTE
5056 5261 JMP ,+3 /NO
5057 1143 TAD GDREG1 /GET DATA
5060 4461 THOCT /PRINT TWO OCTAL
5061 1144 TAD GDREG2
5062 4460 OCTEL /PRINT FOUR OCTAL
5063 7610 SKP CLA
5064 3200 NTGD, DCA ERRO
5065 1200 TAD ERRO /GET TEXT POINTER
5066 7104 CLL RAL
5067 7420 SNL
5070 5301 JMP NTCRC
5071 3200 DCA ERRO
5072 4457 PRNTER /PRINT CR:
5073 5754 TEXCR
5074 1145 TAD CRREG1
5075 4461 THOCT /PRINT

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5076 1146 TAD CRREG2
5077 4460 OCTEL /PRINT FOUR OCTAL
5100 7610 SKP CLA
5101 3200 NTCRC, DCA ERRO
5102 1361 TAD XTEXT
5103 3364 DCA PCNTR2
5104 1362 TAD XREG
5105 3010 DCA AUTO10
5106 1115 TAD K7771
5107 3363 DCA PCNTR1 /COUNTER FOR # OF HEADS
5110 1200 STRAUT, TAD ERRO /GET TEXT POINTER
5111 7500 SMA
5112 5346 JMP NOTEX /NOT THIS ONE
5113 7104 CLL RAL
5114 3200 DCA ERRO
5115 1364 TAD PCNTR2 /GET TEXT MESSAGE POINTER
5116 2364 ISZ PCNTR2
5117 2364 ISZ PCNTR2
5120 3322 DCA ,+2 /STORE FOR PRNTER
5121 4457 PRNTER /PRINT XX:
5122 7402 HLT /MODIFIED TEXT POINTER
5123 1410 TAD I AUTO10
5124 4460 OCTEL /PRINT FOUR OCTAL
5125 2363 AGAIN, ISZ PCNTR1
5126 5310 JMP STRAUT /CHECK FOR NEXT XX:
5127 7604 LAS /GET SWITCH 5
5130 7006 RTL /SHIFT FOR TESTING
5131 0016 AND K0400 /MASK
5132 7657 SMA CLA /HAS IT INHIBIT HALT
5133 5342 JMP ERHLT9 /NO HALT
5134 7630 SEL CLA /SAME OR NEXT TEST
5135 5340 JMP ,+3 /SAME TEST
5136 1397 TAD INHIBT /GET RETURN
5137 5755 JMP I ESCOPE /CHECK FOR BELL
5140 1356 TAD RETRN2 /GET RETURN
5141 5755 JMP I ESCOPE /CHECK FOR BELL
5142 7402 ERHLT9, HLT /ALL RECOVERABLE ERROR HALTS
5143 4760 JMS I XGTREG /CHECK FOR GET ALL REGISTERS
5144 5756 JMP I RETRN2 /NO, TRY SAME TEST AGAIN
5145 5264 JMP NTGD /DUMP
5146 7104 NOTEX, CLL RAL
5147 3200 DCA ERRO
5150 2364 ISZ PCNTR2
5151 2364 ISZ PCNTR2
5152 2010 ISZ AUTO10
5153 5325 JMP AGAIN

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5154 0207 /
5155 5470 K0207, 0207
5156 0000 ESCOPE, SCOPE
5157 0000 RETRN2, 0
5160 5527 INHIBT, 0
5161 5756 XGTREG, GTREG
5162 0446 XREG, CRREG2
5163 0000 PCNTR1, 0

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5164 0000 PCNTR2, 0
5165 1366 HEDTAD, TAD HEDLST
5166 6614 HEDLST, ERTX1
5167 6627 ERTX2
5170 6643 ERTX3
5171 6661 ERTX4
5172 6671 ERTX5
5173 6703 ERTX6
5174 6715 ERTX7
5175 6725 ERTX8

/
PAGE
/
/SUBROUTINE TO WAIT FOR INTERRUPTS
/IF INTERRUPT OCCURES GO BACK +1
/
5200 0000 IONWT, 0
5201 7450 SNA /FAST OR SLOW
5202 1122 TAD K7740 /GET SLOW CONSTANT
5203 3221 DCA COMP1 /SETUP COUNTER
5204 7240 CLA CMA
5205 3231 DCA COMP2 /SETUP COUNTER
5206 6001 ION /TURN IT ON
5207 2231 ISZ COMP2
5210 5207 JMP , -1
5211 2221 ISZ COMP1
5212 5207 JMP , -3
5213 6002 /TURN IT OFF
5214 5600 JMP I IONWT /NO INT OCCURED
5215 2200 INTADD, ISZ IONWT
5216 4447 DSKSKP /DISK SKIP IOT
5217 7402 ERHLT1, HLT /ERROR, ILLEGAL INTERRUPT
5220 5600 JMP I IONWT /EXIT

/
/ROUTINE TO COMPARE AC TO GDREG2
/
5221 0000 COMP1, 0
5222 3156 DCA ACREG
5223 1156 TAD ACREG /SAVE AC
5224 7041 CIA
5225 1144 TAD GDREG2
5226 7640 SEA CLA /SKIP IF 0,K
5227 2221 ISZ COMP1 /ERROR, DON'T COMPARE
5230 5621 JMP I COMP1

/
/ROUTINE TO COMPARE CRREG1 AND CRREG2 TO
/GDREG1 AND GDREG2.
/
5231 0000 COMP2, 0
5232 7300 CLA CLL
5233 1143 TAD GDREG1
5234 0116 AND K0017
5235 7041 CIA
5236 1145 TAD CRREG1
5237 7640 SEA CLA

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5240 5245 JMP CRERR /NOT THE SAME
5241 1146 TAD CRREG2
5242 7041 CIA
5243 1144 TAD GDREG2
5244 7640 SEA CLA
5245 2231 CRERR, ISZ COMP2 /ERROR, NOT THE SAME
5246 5631 JMP I COMP2

/
/ROUTINE TO WAIT FOR 500 MS.
/
5247 0000 WTISE, 0
5250 7300 CLA CLL
5251 1122 TAD K7740 /GET TIME CONSTANT
5252 3221 DCA COMP1
5253 3231 DCA COMP2
5254 2231 ISZ COMP2
5255 5254 JMP , -1
5256 2221 ISZ COMP1
5257 5254 JMP , -3
5260 5647 JMP I WTISE /EXIT

/
/ROUTINE TO WAIT FOR DISK SKIPS
/
5261 0000 SKWAT, 0
5262 7300 CLA CLL
5263 1122 TAD K7740 /GET TIME CONSTANT
5264 3221 DCA COMP1
5265 3231 DCA COMP2
5266 4447 DSKSKP /DISK "DISK SKIP IOT"
5267 7610 SKP CLA /NO SKIP OCCURRED YET
5270 5276 JMP , +6 /GOT THE SKIP
5271 2231 ISZ COMP2
5272 5266 JMP , -4
5273 2221 ISZ COMP1
5274 5266 JMP , -6
5275 7610 SKP CLA /NO SKIP OCCURRED
5276 2261 ISZ SKWAT
5277 5661 JMP I SKWAT /EXIT

/
/SUBROUTINE TO READ STATUS REGISTER
/
5300 0000 RDST, 0
5301 6745 IOTS, DRST /READ STATUS IOT
5302 7410 SKP
5303 7402 ERHLT5, HLT /SKIP TRAP
5304 3147 DCA STREG /SAVE RESULT5
5305 1147 TAD STREG
5306 5700 JMP I RDST /EXIT

/
/SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
/
5307 0000 LDCA, 0
5310 3154 DCA ADREG /SAVE IN ADDRESS
5311 1154 TAD ADREG
5312 3153 DCA CAREG /SETUP INITIAL CURRENT ADDRESS

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5313 1154 TAD ADREG
5314 6744 IOT4, DLCA /LOAD CURRENT ADDRESS IOT
5315 5707 JMP I LDCA /EXIT

5316 7402 ERHLT4, HLT /SKIP TRAP
/
/
/SUBROUTINE TO LOAD TRACK ADDRESS REGISTER
/
5317 0000 LDAD, 0
5320 3152 DCA DAREG /SAVE OUTBOUND DATA
5321 1152 TAD DAREG
5322 6743 IOT3, DLG /LOAD DISK ADDRESS REGISTER
5323 5717 JMP I LDAD /EXIT
5324 7402 ERHLT3, HLT /SKIP TRAP
/
/SUBROUTINE TO LOAD COMMAND REGISTER
/
5325 0000 LDCM, 0
5326 3151 DCA CMREG /SAVE OUTBOUND DATA
5327 1151 TAD CMREG
5330 6746 IOT6, DLDC /LOAD COMMAND REGISTER
5331 5725 JMP I LDCM /EXIT
5332 7402 ERHLT6, HLT /SKIP TRAP
/
/SUBROUTINE TO ISSUE "DSKP" DISK SKIP IOT
/
5333 0000 SDKP, 0
5334 6741 IOT1, DSKP /DISK SKIP IOT
5335 7410 SKP /DID NOT SKIP
5336 2333 ISZ SDKP
5337 5733 JMP I SDKP /EXIT
/
/SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
/
5340 0000 CLDR, 0
5341 6742 IOT2, DCLR /DCLR "CLEAR IOT"
5342 5740 JMP I CLDR /EXIT
5343 7402 ERHLT2, HLT /SKIP TRAP
/
/SUBROUTINE TO ISSUE "DMAN" MAINTENANCE IOT
/
5344 0000 LDMN, 0
5345 6747 IOT7, DMAN /"DMAN" MAINTENANCE IOT
5346 5744 JMP I LDMN /EXIT
5347 7402 ERHLT7, HLT /SKIP TRAP
/
/SUBROUTINE TO SHIFT, THEN READ DISK ADDRESS
/INTO DATA BUFFER. 12 SHIFTS
/
5350 0000 RDAD, 0
5351 7300 CLA CLL
5352 1130 TAD M12

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5353 3134 DCA SBCNT1
5354 7332 CLA CLL CML RAR /SET MAIN(1) ENABLE BIT
5355 4455 LDMAN /LOAD MAINTENANCE
5356 7010 RAR
5357 4455 LDMAN /LOAD MAINTENANCE
5360 7300 CLA CLL
5361 1015 TAD K0200 /SHIFT TRACK ADDRESS BIT
5362 4455 LDMAN /LOAD MAINTENANCE IOT
5363 2134 ISZ SBCNT1
5364 5362 JMP , -2 /SHIFT 12 BITS
5365 7300 CLA CLL
5366 1012 TAD K0020
5367 4455 LDMAN /READ DATA BUFFER
5370 3152 DCA DAREG /SAVE RESULTS
5371 1152 TAD DAREG
5372 5757 JMP I RDAD /EXIT

5400 PAGE
/
/SUBROUTINE TO READ DATA BUFFER TO AC
/
5400 0000 RDBF, 0
5401 7330 CLA CLL CML RAR
5402 4455 LDMAN
5403 1012 TAD K0020
5404 4455 LDMAN /LOAD MAINTENANCE
5405 3150 DCA DBREG
5406 1150 TAD DBREG
5407 3155 DCA DTREG
5410 1155 TAD DTREG
5411 5600 JMP I RDBF /EXIT
/
/SUBROUTINE TO SHIFT COMMAND REGISTER TO
/ DATA BUFFER THEN READ DATA BUFFER
/
5412 0000 RDCM, 0
5413 7300 CLA CLL
5414 1130 TAD M12
5415 3134 DCA SBCNT1 /12 BIT SHIFT
5416 7330 CLA CLL CML RAR
5417 4455 LDMAN /LOAD MAINTENANCE
5420 7010 RAR
5421 4455 LDMAN /LOAD MAINTENANCE
5422 7300 CLA CLL
5423 1016 TAD K0400 /ENABLE BIT FOR SHIFT COMMAND
5424 4455 LDMAN /LOAD AND GO
5425 2134 ISZ SBCNT1
5426 5224 JMP , -2 /SHIFT 12
5427 7300 CLA CLL
5430 1012 TAD K0020 /ENABLE READ BUFFER
5431 4455 LDMAN /LOAD AND GO
5432 3151 DCA CMREG /SAVE I
5433 1151 TAD CMREG
5434 5612 JMP I RDCM /EXIT

```

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/ROUTINE TO ZERO WORK BUFFER
/
5435 0000 KLBUF, 0
5436 7340 CLA CLL CMA
5437 1067 TAD BGNBUF /START OF BUFFER -1
5440 3010 DCA AUTO10 /SETUP AUTO INDEX
5441 1123 TAD K7400
5442 3164 DCA DATCNT /SETUP COUNTER
5443 3410 DCA I AUTO10 /CLEAR BUFFER
5444 2164 ISZ DATCNT /UPDATE COUNTER
5445 9243 JMP ,-2 /NOT ALL CLEARED YET
5446 5635 JMP I KLBUF /BUFFER CLEARED
/
/ROUTINE TO FILL THE WORK BUFFER WITH
/THE COMPLEMENT DATA THATS IN THE AC.
/
5447 0000 FLBUF, 0
5450 3165 DCA SAVDAT /SAVE DATA WORD
5451 7340 CLA CLL CMA
5452 1067 TAD BGNBUF /START OF BUFFER -1
5453 3010 DCA AUTO10 /SETUP AUTO INDEX
5454 1124 TAD K7600
5455 3164 DCA DATCNT /SETUP COUNTER
5456 1165 LPDAT, TAD SAVDAT /GET FIRST WORD
5457 3410 DCA I AUTO10 /STORE IN BUFFER
5460 1165 TAD SAVDAT /GET SECOND WORD
5461 7040 CMA /COMPLEMENT IT
5462 3410 DCA I AUTO10 /STORE IN BUFFER
5463 2164 ISZ DATCNT /UPDATE COUNTER
5464 5256 JMP LPDAT /MORE WORDS TO GO
5465 1101 TAD K1234
5466 3410 DCA I AUTO10 /MAKE WORD IN BUFFER + 1
5467 5647 JMP I FLBUF /BUFFER FULL
/
/ROUTINE TO CHECK FOR WAIT AND RECALIBRATE
/
5470 3326 SCOPE, DCA TOTST /SAVE SCOPE LOOP POINTER
5471 7604 LAS /GET SWITCH 7
5472 0012 AND K0020 /MASK
5473 7640 SZA CLA /WAIT LOOP?
5474 4433 WATISZ /YES
5475 7604 LAS /GET SWITCH 6
5476 0013 AND K0040 /MASK
5477 7650 SNA CLA /IS IT CLEAR DISK
5500 5322 JMP NOCLR /NO, DON'T
5501 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
5502 4453 CLRALL /CLEAR CONTROL
5503 1151 TAD CMREG /GET LAST COMMAND
5504 0325 AND K7577 /MASK OUT SET DONE
5505 4450 LDCMD /LOAD COMMAND
5506 7326 CLA CLL CML RTL /ENABLE RECALIBRATE
5507 4453 CLRALL /RECALIBRATE
5510 4432 SKPWAT /WAIT FOR FIRST DONE
5511 7000 NOP
5512 1151 TAD CMREG /LAST COMMAND

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5513 1015 TAD K0200
5514 4450 LDCMD /LOAD COMMAND
5515 4432 SKPWAT /WAIT FOR SECOND DONE
5516 7000 NOP
5517 1151 TAD CMREG
5520 0325 AND K7577 /MASK SET DONE
5521 3151 DCA CMREG
5522 7301 NOCLR, CLA CLL IAC /ENABLE CLEAR CONTROL
5523 4453 CLRALL /CLEAR CONTROL
5524 5726 JMP I TOTST /GO TO TEST
/
5525 7577 K7577, 7577
5526 0000 TOTST, 0
/
/ROUTINE TO GET ALL REGISTERS
/(NOTE: THIS ROUTINE WILL CAUSE ONE MAINTENANCE
/ DATA BREAK TO LOCATION 0 IF THE LAST PREVIOUS
/ FUNCTION EXECUTED WAS A READ DATA BREAK.)
/
5527 0000 GTREG, 0
5530 7604 LAS /GET SWITCH 8
5531 0011 AND K0010 /MASK
5532 7650 SNA CLA /HAS IT GET ALL REGISTERS
5533 5727 JMP I GTREG /NO, GO BACK
5534 2327 ISZ GTREG /YES, UPDATE POINTER
5535 4444 RDSTAT /READ STATUS
5536 4456 RDBUF /READ LOWER BUFFER
5537 7300 CLA CLL
5540 4451 LDCUR /SET CA TO 0 FOR BREAK
5541 7332 CLA CLL CML RTR /ENABLE SHIFT TO LOWER BUFFER
5542 4455 LDMAN /BREAK IF LAST BREAK WAS A READ
5543 4454 RDCRC /READ CRC
5544 4446 RDADD /READ TRACK
5545 4445 RDCMD /READ COMMAND
5546 4462 CRLF
5547 7301 CLA CLL IAC /ENABLE CLEAR CONTROL
5550 4453 CLRALL /CLEAR CONTROL
5551 1124 TAD K7600
5552 5727 JMP I GTREG /EXIT
/
/ROUTINE TO SEND DRIVES ON AN OVERLAP SEEK
/
5553 0000 DOUT, 0
5554 3327 DCA GTREG /SAVE ADDRESS
5555 7004 RAL
5556 1070 TAD DRIVNO /GET CURRENT DRIVE
5557 4450 LDCMD /LOAD COMMAND REGISTER
5560 1151 TAD CMREG /GET LAST COMMAND ISSUED
5561 1103 TAD K3000 /ADD IN SEEK ONLY FUNCTION
5562 1157 TAD HOMEHA /ADD IN CURRENT FIELD
5563 4450 LDCMD /LOAD COMMAND REGISTER
5564 1327 TAD GTREG /GET SAVED ADDRESS
5565 4452 LDADD /LOAD AND GO
5566 4447 DSKSKP /WAIT FOR FIRST DONE FLAG
5567 5366 JMP ,-1 /HANG IF NO SKIP

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5570 9753          JMP I   DOUT          /DISK IS OUT
/
5600          /PAGE
/ROUTINE TO READ OR WRITE ON DISK
/RETURN +1 SKIP OR STATUS ERROR
/RETURN +2 O.K.
/
5600 0000  DISKG, 0
5601 3254          DCA   SAVTRK          /SAVE TRACK ADDRESS
5602 7340          CLA  CLL  CMA
5603 3173          DCA   SOFERR          /SET CRC ERROR FLAG
5604 1600          TAD  I   DISKG          /GET TEXT POINTER
5605 3174          DCA   SAVPCT          /SAVE IT
5606 2200          ISZ  DISKG          /UPDATE POINTER
5607 1151          TAD  CMREG          /GET COMMAND
5610 0255          AND  K7501          /MASK OFF
5611 1157          TAD  HOMEA          /CURRENT FIELD
5612 1070          TAD  DRIVNO          /CURRENT DRIVE
5613 4450          LDCMD          /LOAD COMMAND
5614 1067          TAD  BGNBUF          /GET BEGINNING OF BUFFER
5615 4451          LDCUR          /LOAD CURRENT ADDRESS
5616 1254          TAD  SAVTRK          /GET TRACK + SECTOR
5617 4452          LDADD          /LOAD AND GO
5620 4432          SKPHAT          /WAIT FOR DISK SKIP
5621 5234          JMP   SKPERR          /ERROR, NO SKIP
5622 7330          CLA  CLL  CML RAR          /EXPECTED STATUS
5623 3144          DCA   GDREG2          /SETUP COMPARE REGISTER
5624 4444          ROSTAT          /READ STATUS
5625 1104          TAD  K4000
5626 7640          SZA  CLA          /HAS STATUS 4000
5627 5236          JMP   STAERR          /ERROR, STATUS
5630 1167          TAD  K5373          /TEXT POINTER
5631 2200          ISZ  DISKG          /UPDATE FOR GOOD RETURN
5632 3574          RETRN, DCA I SAVPCT          /STORE IN TEXT POINTER
5633 5600          JMP  I   DISKG          /EXIT
5634 1166          SKPERR, TAD  K0306          /SKIP TEXT POINTER
5635 5232          JMP   RETRN          /EXIT
5636 1147          STAERR, TAD  STREG          /GET STATUS JUST READ
5637 0211          AND  K0010          /MASK OUT CRC ERRORS
5640 7657          SNA  CLA          /WERE THERE ANY
5641 5252          JMP   HRDERR          /NO, OTHERS
5642 7300          CLA  CLL
5643 1151          TAD  CMREG          /GET LAST COMMAND
5644 0106          AND  K7000          /MASK FUNCTION
5645 1105          TAD  K6000          /ADD IN FUDGE FACTOR
5646 7630          SZA  CLA          /HAS IT A READ ALL OR READ
5647 5252          JMP   HRDERR          /NO, MUST BE A WRITE
5650 3173          DCA   SOFERR          /SET CRC ERROR FLAG
5651 9230          JMP   RETRN -2          /GO CHECK DATA OR RETURN
5652 1170          HRDERR, TAD  K5300
5653 5232          JMP   RETRN          /EXIT
/
5654 0000          SAVTRK, 0
5655 7501          K7501, 7501

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/ROUTINE TO COMPARE WORDS IN BUFFER TO
/KNOWN DATA PATTERN IN THE AC.
/
5656 0000  FIGURE, 0
5657 3144          DCA   GDREG2          /SAVE FOR ERROR PRINTER
5660 1067          TAD  BGNBUF          /GET START OF BUFFER
5661 3154          DCA   ADREG          /SAVE FOR ERROR PRINTER
5662 1151          TAD  CMREG          /GET DISK NO. AND EXT. BIT
5663 0100          AND  K0007          /MASK THEM
5664 7041          CIA
5665 1554          TAD  I   ADREG          /GET FIRST TRACK WORD
5666 7650          SNA  CLA          /HAS IT O.K. ?
5667 5273          JMP   ,+4          /YES, CHECK NEXT TRACK WORD
5670 1151          TAD  CMREG          /GET DISK NO. AND EXT. BIT
5671 0100          AND  K0007          /MASK THEM
5672 5343          JMP   DTERR          /DATA ERROR
5673 2154          ISZ  ADREG          /UPDATE ADDRESS
5674 1554          TAD  I   ADREG          /GET SECOND WORD
5675 7041          CIA
5676 1152          TAD  DAREG          /COMPARE TO ADDRESS
5677 7650          SNA  CLA          /HAS SECOND TRACK WORD O.K.
5700 5303          JMP   ,+3          /YES, NOW CHECK DATA
5701 1152          TAD  DAREG          /GET GOOD INFO
5702 5343          JMP   DTERR          /DATA ERROR
5703 7326          CLA  CLL  CML RTL
5704 1123          TAD  K7400
5705 3164          DCA   DATCNT          /SETUP COUNTER
5706 2154          LPMFIG, ISZ  ADREG          /UPDATE ADDRESS
5707 1554          TAD  I   ADREG          /GET DATA WORD
5710 7041          CIA
5711 1144          TAD  GDREG2          /COMPARE TO GOOD ONE
5712 7640          SZA  CLA          /HAS WORD O.K.?
5713 5344          JMP   DTERR +1          /NO, DATA ERROR
5714 1144          TAD  GDREG2          /GET GOOD DATA
5715 7040          CIA
5716 3144          DCA   GDREG2          /IT IS A COMPLEMENT DATA PATTERN
5717 2164          ISZ  DATCNT          /UPDATE BUFFER COUNTER
5720 5306          JMP   LPMFIG          /MORE TO CHECK
5721 2154          ISZ  ADREG          /UPDATE ADDRESS
5722 1101          TAD  K1234
5723 7041          CIA
5724 1554          TAD  I   ADREG          /GET WORD IN BUFFER +1
5725 7650          SNA  CLA          /HAS IT O.K.
5726 5331          JMP   ,+3          /YES ALL DATA O.K.
5727 1101          TAD  K1234
5730 5343          JMP   DTERR          /WORD LOST IN BUFFER +1
5731 7330          CLA  CLL  CML RAR          /EXPECTED STATUS
5732 3144          DCA   GDREG2          /SETUP COMPARE REGISTER
5733 1173          TAD  SOFERR          /GET CRC ERROR FLAG
5734 7640          SZA  CLA          /HAS IT SET
5735 5656          JMP  I   FIGURE          /NO THE BUFFER IS O.K.
5736 7340          CLA  CLL  CMA          /SETUP CRC FLAG
5737 3173          DCA   SOFERR          /RESET FLAG
5740 1170          TAD  K5300          /TEXT MESS

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5741 3574          DCA I   SAVPCT          /SETUP TEXT POINTER
5742 7331          CLA CLL  CML RAR          /EXPECTED STATUS
5743 3144          DTERR,   DCA      GDREG2          /SETUP COMPARE
5744 1554          TAD I   ADREG          /GET BAD WORD
5745 3155          DCA      DTREG          /SAVE FOR PRINTER
5746 2256          ISZ     FGURE          /UPDATE FOR ERROR RETURN
5747 5656          JMP I

/
5750 2003          TEXPC,   TEXT  "PC:"
5751 7200
5752 0704          TEXGD,   TEXT  "GD:"
5753 7200
5754 0322          TEXCR,   TEXT  "CR:"
5755 7200
5756 2324          TEXST,   TEXT  "ST:"
5757 7200
5760 0402          TEXDB,   TEXT  "DB:"
5761 7200
5762 0315          TEXCM,   TEXT  "CM:"
5763 7200
5764 0401          TEXDA,   TEXT  "DA:"
5765 7200
5766 0301          TEXCA,   TEXT  "CA:"
5767 7200
5770 0104          TEXAD,   TEXT  "AD:"
5771 7200
5772 0424          TEXDT,   TEXT  "DT:"
5773 7200

/
6000          PAGE
/
/SUBROUTINE TO SHIFT CRC REGISTER TO DATA
/BUFFER THEN READ IT.
/
RDCR, 0
6001 7300          CLA CLL
6002 1131          TAD      M12
6003 3134          DCA      SBCNT1          /12 SHIFTER
6004 7331          CLA CLL  CML RAR
6005 4455          LDMAN          /LOAD MAINTENANCE
6006 7210          RAR
6007 4455          LDMAN          /LOAD MAINTENANCE
6008 7210          RAR
6009 4455          LDMAN          /LOAD AND GO
6010 7210          RAR
6011 4455          LDMAN          /LOAD AND GO
6012 2134          ISZ     SBCNT1
6013 5211          JMP      ,-2          /12 BIT SHIFT
6014 7300          CLA CLL
6015 1012          TAD      K0020          /ENABLE READ BUFFER
6016 4455          LDMAN
6017 3146          DCA      CRREG2          /SAVE IT
6018 1131          TAD      M12
6019 3134          DCA      SBCNT1          /12 BIT SHIFTER
6020 7331          CLA CLL  CML RTR
6021 4455          LDMAN          /LOAD MAINTENANCE
6022 4455          RAR
6023 7210
6024 7210

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6025 4455          LDMAN          /LOAD AND GO
6026 2134          ISZ     SBCNT1
6027 5225          JMP      ,-2          /12 BIT SHIFT

/
6030 7300          CLA CLL
6031 1012          TAD      K0020          /ENABLE READ BUFFER
6032 4455          LDMAN
6033 0116          AND      K0017
6034 3145          DCA      CRREG1          /SAVE OTHER HALF
6035 5600          JMP I   RDCR          /EXIT

/
/SUBROUTINE TO PRINT TWO OCTAL
/
TOCT, 0
6036 0000          DCA      SBCNT1          /SAVE AC
6037 3134          TAD      SBCNT1
6040 1134          RAR
6041 7210          RTR
6042 7012          AND      K0007
6043 0100          TAD      K0260
6044 1264          TYPE          /PRINT FIRST BYTE
6045 4436          TAD      SBCNT1
6046 1134          AND      K0007
6047 0100          TAD      K0260
6050 1264          TYPE          /PRINT SECOND BIT
6051 4436          JMP I   TOCT          /EXIT
6052 5636

/
/
/ROUTINE TO DO CRLF
/
UPONE, 0
6053 0000          CLA CLL
6054 7300          TAD      K0215
6055 1262          TYPE
6056 4436          TAD      K0212
6057 1263          TYPE
6060 4436          JMP I   UPONE

/
K0215, 0215
6062 0215          K0212, 0212
6063 0212          K0260, 0260
6064 0260          K0240, 0240
6065 0240

/
/ROUTINE TO PRINT FOUR OCTAL
/
FROCT, 0
6066 0000          RTL
6067 7006          RTL
6070 7006          DCA      UPONE
6071 3253          TAD      M4
6072 1131          DCA      TOCT
6073 3236          TAD      UPONE
6074 1253          AND      K0007
6075 0100

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6076 1264 TAD K0260
6077 4436 TYPE
6100 1253 TAD UPONE
6101 7006 RTL
6102 7004 RAL
6103 3253 DCA UPONE
6104 2236 ISZ TOCT
6105 5274 JMP , -11
6106 1265 TAD K0240
6107 4436 TYPE
6110 5666 JMP I FROCT

/
/SUBROUTINE TO PRINT TEXT
/
6111 0000 PRN, 0
6112 7300 CLA CLL
6113 1711 TAD I PRN /GET POINTER

6114 2311 ISZ PRN
6115 3266 DCA FROCT
6116 1666 TAD I FROCT
6117 0110 AND K7700
6120 7450 SNA
6121 5345 JMP EXIT
6122 7500 SMA
6123 7020 CML
6124 7001 IAC
6125 7012 RTR
6126 7012 RTR
6127 7012 RTR
6130 4436 TYPE
6131 1666 TAD I FROCT
6132 0111 AND K0077
6133 7450 SNA
6134 5345 JMP EXIT
6135 1350 TAD K3740
6136 7500 SMA
6137 1347 TAD K4100
6140 1265 TAD K0240
6141 4436 TYPE
6142 2266 ISZ FROCT
6143 7300 CLA CLL
6144 5316 JMP PRN+5
6145 7300 EXIT, CLA CLL
6146 5711 JMP I PRN

/
6147 4100 K4100, 4100
6150 3740 K3740, 3740
/
/ROUTINE TO TYPE
/
6151 0000 PRINT, 0
6152 6046 TLS

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6153 6041 TSF
6154 5353 JMP , -1
6155 6042 TCF
6156 7200 CLA
6157 5751 JMP I PRINT

/
PAGE
/
/ROUTINE TO RECALIBRATE SELECTED DRIVE OR
/SEEK ONLY POSITION IN AC ON SELECTED DRIVE.
/
6200 0000 RESTOR, 0
6201 7300 CLA CLL
6202 1600 TAD I RESTOR /GET TEXT POINTER
6203 3315 DCA SAVPC /SAVE FOR ERROR
6204 2200 ISZ RESTOR /UPDATE PC
6205 1200 TAD RESTOR /GET PC
6206 3215 DCA ONLY /SAVE FOR END OF SEEK ROUTINE
6207 1070 TAD DRIVNO /CURRENT DRIVE
6210 1157 TAD HOMEMA /CURRENT FIELD
6211 4450 LDCMD /LOAD COMMAND
6212 7326 CLA CLL CML RTL /ENABLE RECALIBRATE BIT
6213 4453 CLRALL /"RECALIBRATE"
6214 5232 JMP CHECK /CHECK FOR ERRORS

/
ONLY, 0
6215 0000
6216 3316 DCA SAVTO /SAVE LOWER TRACK BITS
6217 1615 TAD I ONLY /GET TEXT POINTER
6220 3315 DCA SAVPC /SAVE FOR ERROR
6221 2215 ISZ ONLY
6222 1151 TAD CHREG /GET COMMAND
6223 0072 AND K0001 /MASK OFF EXTENDED BIT
6224 1157 TAD HOMEMA /CURRENT FIELD
6225 1070 TAD DRIVNO /CURRENT DRIVE
6226 1103 TAD K3000 /SEEK ONLY FUNCTION
6227 4450 LDCMD /LOAD COMMAND
6230 1316 TAD SAVTO /GET POSITION
6231 4452 LDADD /LOAD AND GO
6232 4432 CHECK, SKPWAT /WAIT FOR FIRST DONE FLAG
6233 5313 JMP SEKER1 /ERROR, NO SKIP
6234 733 CLA CLL CML RAR /EXPECTED STATUS
6235 3144 DCA GDREG2 /SETUP COMPARE REGISTER
6236 1122 TAD K7740
6237 3320 DCA RNAD /SETUP SKIP TIMER
6240 4444 ROSTAT /READ STATUS
6241 1104 TAD K4000
6242 7650 SNA CLA /WAS DRIVE DONE?
6243 5252 JMP , +7 /YES
6244 1105 TAD K6000 /NO, DRIVE MUST BE BUSY!
6245 3144 DCA GDREG2 /EXPECTED STATUS
6246 1147 TAD STREG /GET STATUS READ
6247 1102 TAD K2000 /ADD IN FUDGE FACTOR
6250 7647 SZA CLA /WAS DRIVE BUSY
6251 5313 JMP SEKER2 /NO, ERROR
6252 1015 TAD K0200 /ENABLE SET SECOND DONE FLAG

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6253 1151 TAD CHREG /ORIGINAL COMMAND
6254 4457 LDCMD /LOAD COMMAND
6255 7332 CLA CLL CML RTR
6256 3144 DCA GDREG2 /EXPECTED STATUS
6257 4444 CHKSKP, RDSTAT /READ STATUS
6260 4447 DSKSKP /FLAG SET?
6261 7410 SKP /NO
6262 5273 JMP GOTSKP /YES GOT IT!
6263 1105 TAD K0000
6264 7640 SZA CLA /DRIVE BUSY?
6265 5310 JMP SEKER2 /NO, ERROR
6266 2364 ISZ RNWRD4
6267 5257 JMP CHKSKP
6270 2320 ISZ RNAD
6271 5257 JMP CHKSKP
6272 5313 JMP SEKER1 /ERROR, NO SKIP!
6273 7337 GOTSKP, CLA CLL CML RAR
6274 3144 DCA GDREG2 /SETUP EXPECTED STATUS
6275 4444 PDSTAT /READ STATUS
6276 1104 TAD K4000
6277 7640 SZA CLA /WAS IT ONLY DONE FLAG
6300 5310 JMP SEKER2 /NO, ERROR STATUS
6301 1151 TAD CHREG /GET LAST COMMAND
6302 0317 AND A7577 /MASK OUT
6303 4457 LDCMD /CLEAR STATUS
6304 3144 DCA GDREG2 /SETUP COMPARE REGISTER
6305 4444 RDSTAT /READ STATUS
6306 7650 SNA CLA /WAS STATUS 0000?
6307 2215 ISZ ONLY /UPDATE PC
6310 1170 SEKER2, TAD K5300
6311 3715 GOBAK, DCA I SAVPC /SETUP TEXT POINTER
6312 5615 JMP I ONLY /BACK TO TEST
6313 1166 SEKER1, TAD K0306 /SKIP TEXT POINTER
6314 5311 JMP GOBAK /EXIT

/
6315 0000 SAVPC, 2
6316 0000 SAVTO, 3
6317 7577 A7577, 7577
/
/ROUTINE TO GET A RANDOM DISK ADDRESS
/
6320 0000 RNAD, 2
6321 3363 DCA SAVPOT /SAVE DISK NO, POINTER
6322 7101 CLL IAC
6323 1362 TAD RNWRD1
6324 1363 TAD RNWRD2
6325 7106 CLL RTL
6326 3362 DCA RNWRD1
6327 1363 TAD RNWRD2
6330 7012 RTR
6331 1362 TAD RNWRD1
6332 3363 DCA RNWRD2
6333 1363 TAD RNWRD2
6334 7427 SNL
6335 5341 JMP GOTADD /USE THIS AS DISK ADDRESS

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6336 1172 TAD ENDTRK /HAVE TO CHECK BOUNDARIES
6337 7207 CLA
6340 1363 TAD RNWRD2 /GET SAME
6341 3364 GOTADD, DCA RNWRD4 /SAVE WORD
6342 1361 TAD DSKSAV /GET POINTER
6343 1367 TAD SAVPOT /ADD IN DRIVE NUMBER
6344 3366 DCA SAVPOT /MAKE ADDRESS
6345 1364 TAD RNWRD4 /GET WORD
6346 3760 DCA I SAVPOT /STORE IT
6347 1363 TAD SAVPOT
6350 1075 TAD K0004 /ADD IN FUDGE FACTOR
6351 3362 DCA SAVPOT /MAKE ADDRESS
6352 7004 RAL
6353 3762 DCA I SAVPOT /GET THE LINK
6354 1767 TAD I SAVPOT /SAVE EXTENDED BIT
6355 7110 CLL RAR /GET IT
6356 1364 TAD RNWRD4 /SHIFT
6357 5720 JMP I RNAD /GET WORD
/EXIT

/
6360 0000 SAVPOT, 0
6361 0365 DSKSAV, DSK0A
6362 1234 RNWRD1, 1234
6363 2345 RNWRD2, 2345
6364 0000 RNWRD4, 0
6365 0000 DSK0A, 0
6366 0000 DSK1A, 0
6367 0000 DSK2A, 0
6370 0000 DSK3A, 0
6371 0000 DSK0B, 0
6372 0000 DSK1B, 0
6373 0000 DSK2B, 0
6374 0000 DSK3B, 0
/
6400 PAGE
/
/ROUTINE FOR "NO ERRORS" AND SCOPE
/LOOPS. UPDATE UP COUNTER "REG1" ON EVERY ENTRY.
/
6400 0000 NERRO, 0
6401 2220 ISZ NERRO
6402 7300 CLA CLL
6403 1600 TAD I NERRO /GET RESTART ADDRESS
6404 3175 DCA RESTRT /STORE
6405 7604 LAS /GET SWITCH 4
6406 0015 AND K0200 /MASK
6407 7640 SZA CLA /PROGRAM HALT
6410 7402 STPHLT, HLT /STOP HALT FROM SWR4=1
6411 7604 LAS /GET SWITCH 1
6412 7004 RAL
6413 7707 SMA CLA /IS IT SCOPE LOOP
6414 5217 JMP ,+3 /NO
6415 1607 TAD I NERRO /GET RETURN POINTER
6416 5631 JMP I NSCOPE /CHECK FOR WAIT AND RETURN
6417 1132 TAD REG0
6420 7640 SZA CLA /1 OR 4096 PASSES

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6421 5224      JMP      NEXTST      /1 PASS PER TEST
6422 2133      ISZ     REG1      /UPDATE UPCOUNTER
6423 5575      JMP I     RESTRT      /BACK TO SAME TEST
6424 7301      NEXTST, CLA CLL IAC /ENABLE CLEAR CONTROL
6425 4453      CLRALL      /CLEAR CONTROL
6426 2201      ISZ     NERRO      /UPDATE PC STORE
6427 2201      ISZ     NERRO      /UPDATE PC STORE
6430 5607      JMP I     NERRO      /TO NEXT SEQUENTIAL TEST

/
6431 5472      NSCOPE, SCOPE
/
/ROUTINE TO DO HALF BLOCK DATA CHECKS
/
6432 0000      HFCHK, 2
6433 3144      DCA     GDREG2      /SETUP FOR ERROR PRINTER
6434 1067      TAD     BGNBUF      /GET START OF BUFFER
6435 3154      DCA     ADREG      /FOR ERROR PRINTER
6436 1151      TAD     CMREG
6437 0100      AND     K0007
6440 7041      CIA
6441 1554      TAD I   ADREG      /COMPARE TO BUFFER WORD
6442 7650      SNA CLA /SAME ?
6443 5247      JMP     ,+4         /YES
6444 1151      TAD     CMREG
6445 0100      AND     K0007
6446 5330      JMP     HFERR      /NO
6447 2154      ISZ     ADREG      /UPDATE ADDRESS
6450 1554      TAD I   ADREG
6451 7041      CIA
6452 1152      TAD     DAREG      /COMPARE TO DISK ADDRESS
6453 7650      SNA CLA /SAME???)
6454 5257      JMP     ,+3         /YES
6455 1152      TAD     DAREG
6456 5330      JMP     HFERR      /NO
6457 2154      ISZ     ADREG      /UPDATE ADDRESS
6460 7326      CLA CLL CML RTL
6461 1124      TAD     K7600
6462 3164      DCA     DATCNT      /SETUP COUNTER FOR FIRST HALF
6463 1554      HFR1, TAD I   ADREG
6464 7041      CIA
6465 1144      TAD     GDREG2      /COMPARE TO GOOD VALUE
6466 7640      SZA CLA /WERE THEY THE SAME
6467 5331      JMP     HFERR +1   /ERROR, DATA BREAK
6470 2154      ISZ     ADREG      /UPDATE ADDRESS POINTER
6471 1144      TAD     GDREG2
6472 7040      CMA
6473 3144      DCA     GDREG2      /NEXT WORD IS COMPLEMENT
6474 2164      ISZ     DATCNT
6475 5263      JMP     HFR1      /MORE TO TEST IN FIRST HALF
6476 1124      TAD     K7600
6477 3164      DCA     DATCNT      /SETUP COUNTER
6500 3144      DCA     GDREG2      /REST OF BUFFER SHOULD BE 0000
6501 1554      HFR2, TAD I   ADREG
6502 7640      SZA CLA /WAS IT 0
6503 5330      JMP     HFERR      /ERROR

```

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6504 2154      ISZ     ADREG
6505 2164      ISZ     DATCNT
6506 5301      JMP     HFR2
6507 1554      TAD I   ADREG      /MORE TO CHECK
6510 7041      CIA
6511 1101      TAD     K1234
6512 7650      SNA CLA /WAS IT O.K.?
6513 5316      JMP     ,+3         /YES
6514 1101      TAD     K1234
6515 5330      JMP     HFERR      /ERROR, BUFFER +1
6516 7333      CLA CLL CML RAR      /EXPECTED STATUS
6517 3144      DCA     GDREG2      /SETUP COMPARE REGISTER
6520 1173      TAD     S0FERR      /GET CRC ERROR FLAG
6521 7640      SZA CLA /WAS IT SET
6522 5632      JMP I   HFCHK      /NO ERRORS
6523 7340      CLA CLL CMA
6524 3173      DCA     S0FERR      /RESET CRC ERROR FLAG
6525 1170      TAD     K5300      /TEXT
6526 3574      DCA I   SAVPCT      /SET UP POINTER
6527 7330      CLA CLL CML RAR      /EXPECTED STATUS
6530 3144      HFERR, DCA     GDREG2 /SETUP COMPARE
6531 1554      TAD I   ADREG      /GET BAD WORD
6532 3155      DCA     DTREG      /SAVE FOR PRINTER
6533 2232      ISZ     HFCHK
6534 5632      JMP I   HFCHK

/
/ROUTINE TO CHANGE PROGRAM DEVICE CODES
/
6535 7604      CHANG, LAS
6536 0126      AND     K0770
6537 3232      DCA     HFCHK      /SAVE DESIRED CODE
6540 1362      TAD     CCNTR1
6541 3200      DCA     NERRO
6542 1361      TAD     CHNPOT
6543 3357      DCA     CNGSAV
6544 1757      CHANGR, TAD I   CNGSAV /GET ADDRESS POINTER
6545 3000      DCA     0          /SAVE IT
6546 1400      TAD I   0          /GET OLD IOT CODE
6547 0127      AND     K7007      /MASK
6550 4232      TAD     HFCHK      /ADD IN DESIRED
6551 3400      DCA I   0          /CHANGE CORE
6552 2357      ISZ     CNGSAV      /UPDATE ADDRESS POINTER
6553 2200      ISZ     NERRO      /UPDATE CHANGE COUNTER
6554 5344      JMP     CHANGR
6555 7402      CHNHLT, HLT
6556 5355      JMP     , -1

/
6557 0000      CNGSAV, 0
6560 7746      CCNTR1, 7746
6561 6562      CHNPOT, CHNPOT +1
6562 5334      IOT1
6563 5341      IOT2
6564 5322      IOT3
6565 5314      IOT4
6566 5301      IOT5

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6567	5330			10T6
6570	5345			10T7
6571	2674			10T1A1
6572	2673			10T3A1
6573	2667			10T4A1
6574	2676			10T5A1
6575	2671			10T6A1
6576	3026			10T1A2
6577	3052			10T2A2
6600	3025			10T3A2
6601	3021			10T4A2
6602	3030			10T5A2
6603	3023			10T6A2
6604	2013			T2810A
6605	2015			T2810B
6606	2020			T2810C
6607	2023			T2810D
6610	2074			T2910A
6611	2076			T2910B
6612	2101			T2910C
6613	2104			T2910D
/				
6614	2324	ERTX1,	TEXT	"STATUS REGISTER ERROR"
6615	0124			
6616	2523			
6617	4022			
6620	0507			
6621	1123			
6622	2405			
6623	2240			
6624	0522			
6625	2217			
6626	2200			
6627	0317	ERTX2,	TEXT	"COMMAND REGISTER ERROR"
6630	1515			
6631	0116			
6632	0440			
6633	2205			
6634	0711			
6635	2324			
6636	0522			
6637	4005			
6640	2222			
6641	1722			
6642	0000			
6643	0411	ERTX3,	TEXT	"DISK ADDRESS REGISTER ERROR"
6644	2313			
6645	4001			
6646	0404			
6647	2205			
6650	2323			
6651	4022			
6652	0507			
6653	1123			
6654	2405			

6655	2240			
6656	0522			
6657	2217			
6660	2200			
6661	0411	ERTX4,	TEXT	"DISK DATA ERROR"
6662	2313			
6663	4004			
6664	0124			
6665	0140			
6666	0522			
6667	2217			
6670	2200			
6671	0322	ERTX5,	TEXT	"CRC REGISTER ERROR"
6672	0340			
6673	2205			
6674	0711			
6675	2324			
6676	0522			
6677	4005			
6700	2222			
6701	1722			
6702	0000			
6703	0401	ERTX6,	TEXT	"DATA REGISTER ERROR"
6704	2401			
6705	4022			
6706	0507			
6707	1123			
6710	2405			
6711	2240			
6712	0522			
6713	2217			
6714	2200			
6715	0411	ERTX7,	TEXT	"DISK SKIP ERROR"
6716	2313			
6717	4023			
6720	1311			
6721	2040			
6722	0522			
6723	2217			
6724	2200			
6725	0411	ERTX8,	TEXT	"DISK INTERRUPT ERROR"
6726	2313			
6727	4011			
6730	1624			
6731	0522			
6732	2225			
6733	2024			
6734	4005			
6735	2222			
6736	1722			
6737	0000			
/				
6740	2213	TEXEND,	TEXT	"RK8E DRIVE CONTROL TEST PASS COMPLETE"
6741	7005			
6742	4004			

6743 2211
6744 2605
6745 4003
6746 1716
6747 2422
6750 1714
6751 4024
6752 0523
6753 2440
6754 2001
6755 2323
6756 4003
6757 1715
6760 2014
6761 0524
6762 0500

7000 / *7000
7000 / WRKBUF=
7000 / HITRK=
7001 LOTRK= +1
7377 / ENDBUF= +377
7400 / STPCHK= +400
/

\$\$\$

0000	11110000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0100	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111110
0200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0500	11111111	11111111	11111111	11111111	11111111	11111111	00000000	00000000	00000000
0600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
0700	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11000000	00000001
1000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1100	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11110000	00000000
1200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1300	11111111	11111111	11111111	11111111	11111111	11111111	11000000	00000000	00000000
1400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	10000000	00000000
1600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
1700	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
2000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
2100	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
2200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
2300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11110000	00000000
2400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
2500	11111111	11111111	11111111	11111111	11111111	11111111	10000000	00000000	00000000
2600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
2700	11111111	11111111	11111111	11111111	11000000	00000000	00000000	00000000	00000000
3000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
3100	11111111	11111111	11111111	11111111	11111111	11111111	11111100	00000000	00000000
3200	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
3300	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11110000
3400	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
3500	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11000000
3600	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
3700	11111111	11111111	11111111	11111111	11111111	11111111	10000000	00000000	00000000

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4000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4100 11111111 11111111 11111111 11111111 11111111 11111111 11111110 00000000
4200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 10000001
4400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4500 11111111 11111111 11111111 11111111 11111111 11111111 11111000 00000000
4600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

5000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111000

5200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11100000

5400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 10000000

5600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11100000

6000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6100 11111111 11111111 11111111 11111111 11111111 11111111 00000000 00000000

6200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111000

6400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

6600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6700 11111111 11111111 11111111 11111111 11111111 11111111 11100000 00000000

7000
7100

7200
7300

7400
7500

7600
7700

```

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A7577 6317 DRST 6745 GOTSKP 6273 K0037 0117
A7776 4377 DSK0A 6365 GRNKER 4364 K0040 0013
ACCHP1 4442 DSK0B 6371 GRNKOK 4343 K0077 0111
ACCHP2 4443 DSK1A 6366 GRNKR1 4274 K0100 0014
ACREG 4156 DSK1B 6372 GRNKR2 4330 K0200 0019
ADREG 4154 DSK2A 6367 GRNKR3 4353 K0207 5154
AGAIN 5125 DSK2B 6373 GROMK 4265 K0212 0063
ALLBAK 4250 DSK3A 6370 GTREG 5527 K0215 0062
APA1 4752 DSK3B 6374 HAFCHK 4426 K0240 0065
APERF 4773 DSKADD 4534 HEDHLT 4002 K0260 0064
APHLT1 4776 DSKIN 4421 HEDLST 5166 K0306 0166
APR1 4731 DSKOUT 4420 HEDTAD 5165 K0400 0016
AUT010 4010 DSKP 6741 HFCHK 6432 K0770 0126
AUTPRO 4717 DSKPOT 4535 HFERR 6530 K1000 0017
BGN 0200 DSKSAV 6361 HFR3 6463 K1234 0101
BGNBUP 0067 DSKSKP 4447 HFR2 6501 K2000 0102
CAREG 0153 DTErr 5743 HIRK 7000 K2525 0112
CCNTR1 6560 DTREG 0155 HOMEHA 0157 K3000 0103
CHANG 6535 ENDBUF 7377 HRDERR 5652 K3740 6150
CHANGR 6544 ENDHLT 4072 INHIBT 5157 K4000 0104
CHECK 6232 ENDRK 0172 INTADD 5215 K4100 6147
CHKNEX 4434 ENDTST 4040 INTRQ 0034 K5000 0114
CHKSKP 6257 ERHLT1 5217 IONWAT 4441 K5252 0113
CHNHLT 6555 ERHLT2 5343 IONWT 5200 K5300 0170
CHNROT 6561 ERHLT3 5324 IOT3 5334 K5373 0167
CLDR 5340 ERHLT4 5316 IOT3A1 2674 K5403 0125
CLRALL 4453 ERHLT5 5303 IOT3A2 3026 K6000 0105
CMREG 0151 ERHLT6 5332 IOT2 5341 K6304 0171
CNGSAV 6597 ERHLT7 5347 IOT2A2 3052 K7000 0106
COMP1 5221 ERHLT9 5142 IOT3 5322 K7007 0127
COMP2 5231 ERRA1 5017 IOT3A1 2673 K7156 3750
CRERR 5245 ERRO 5000 IOT3A2 3025 K7400 0123
CRLF 4462 ERROR 4440 IOTA 5314 K7501 5655
CRREG1 0145 ERTX1 6614 IOT4A1 2667 K7577 5525
CRREG2 0146 ERTX2 6627 IOT4A2 3021 K7600 0124
CRWRD1 0162 ERTX3 6643 IOT5 5301 K7700 0110
CRWRD2 0163 ERTX4 6661 IOT5A1 2676 K7707 4707
CYL450 0065 ERTX5 6671 IOT5A2 3030 K7740 0122
DAREG 0152 ERTX6 6703 IOT6 5330 K7760 0107
DATCNT 0164 ERTX7 6715 IOT6A1 2671 K7771 0115
DBREG 0150 ERTX8 6725 IOT6A2 3023 KCDF 0120
DCLR 6742 ESCOPE 5155 IOT7 5345 KILBUF 4431
DIN 4536 EXIT 6145 K0001 0072 KLBUF 5435
DISKG 5600 FGURE 5656 K0002 0073 KRMP 0121
DISKGO 4425 FIGURE 4427 K0003 0074 KTIME 0176
DLAG 6743 FLBUF 4430 K0004 0075 LDAD 5317
DLCA 6744 FLBUF 5447 K0005 0076 LDADD 4452
DLCC 6746 FROCT 6066 K0006 0077 LDCA 5307
DMAN 6747 GDREG1 0143 K0007 0100 LDCM 5325
DOUT 5553 GDREG2 0144 K0010 0011 LDCMD 4450
DRIVNO 0070 GOBAK 6311 K0017 0116 LDCUR 4451
DRIVSV 0071 GOTADD 6341 K0020 0012 LDMAN 4455

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PAL10	V142	10-DEC-74	8:48	PAGE 1-78			
LDMH	5344	RDCM	5412	T12E	0705	T2810C	2020
LOTRK	7001	RDCMD	4445	T12R	0670	T2810D	2023
LPDAT	5456	RDCR	6000	T13E	0756	T280K	2050
LPFIG	5706	RDCRC	4454	T13R	0720	T28R	2006
M12	0130	RDS1	5300	T14KE	1060	T28T	2055
M4	0131	RDSSTAT	4444	T14R	1004	T29E	2131
MANPRO	4101	RECAL	4424	T14SE	1054	T2910A	2074
MANUAL	4602	REDBAK	4517	T15E	1077	T2910B	2076
MPERR	4157	REG0	0132	T15T	1101	T2910C	2101
MPHLT1	4122	REG1	0133	T16E	1117	T2910D	2104
MPHLT2	4162	RESEK	4003	T16T	1121	T290K	2126
MPR1	4123	RESTOR	6200	T17E	1160	T29R	2070
NDIN	4561	RESTR	0175	T17S	1124	T29T	2133
NERR0	640F	RETRN	5632	T17T	1162	T29W	2122
NERROR	4437	RETRN2	5156	T18E	1235	T2E	0313
NEXD5K	4073	RNAD	6320	T18S	1202	T30E	2174
NEXTST	6424	RNWRD1	6362	T18T	1237	T30R	2136
NOCLR	5522	RNWRD2	6363	T19E	1265	T30T	2176
NOTDON	4232	RNWRD4	6364	T190K	1264	T31E	2244
NOTEX	5146	SAMDSK	4064	T19T	1267	T31R	2201
NSCOPE	6431	SAVDAT	0165	T1E	0266	T31T	2246
NTCRC	5101	SAVPC	6315	T20E	1315	T32E	2357
NTGD	5264	SAVPCT	0174	T200K	1314	T32R1	2256
NTGRNK	4335	SAVPOT	6360	T20T	1317	T32R2	2277
NTSEK	4647	SAVTO	6316	T21E	1346	T32R3	2316
OCTEL	4465	SAVTRK	5654	T210K	1345	T32R4	2340
ONLY	6215	SBCNT1	0134	T21T	1350	T32T	2361
OVRDER	4532	SCOPE	5470	T22E	1442	T33E	2507
OVRDOK	4442	SDKP	5333	T22R1	1404	T33R1	2404
OVRERR	4261	SEEK	4423	T22R2	1423	T33R2	2431
OVR LAP	4202	SEKER1	6313	T22T	1444	T33R3	2450
OVR0K	4242	SEKER2	6310	T23E	1506	T33R4	2467
OVR1	4203	SKPERR	5634	T23R1	1451	T33T	2511
OVR2	4207	SKPWAT	4432	T23R2	1470	T34E	2544
OVR3	4225	SKWAT	5261	T23T	1510	T34T	2546
OVR0D1	4403	SOFERR	0173	T24E	1554	T35E	2644
OVR0D2	4407	STAERR	5636	T24S	1513	T36E	2717
OVR0D3	4425	STCON	0161	T24T	1556	T36N	2724
OVRRED	4407	STPCMK	7400	T25E	1642	T36R	2664
PCNTR1	5163	STPHLT	6410	T25S	1602	T36T	2727
PCNTR2	5164	STRAUT	5110	T25T	1644	T37A	3051
POLERR	4431	STREG	0147	T26E	1714	T37E	3075
PRINT	6151	SWSEK	4000	T26R1	1651	T37R	3013
PRN	6111	T0E	0253	T26R2	1673	T37T	3077
PRNTR	4457	T10E	0543	T26T	1716	T38DE	3151
PRSF LD	4222	T10R	0514	T27E	1765	T38E	3140
RANADD	4422	T10T	0545	T27R1	1723	T380K	3150
RAPCNT	5162	T11E	0637	T27R2	1745	T38R	3110
RDAD	5350	T11R1	0602	T27T	1767	T38T	3153
RDADD	4446	T11R2	0612	T28E	2053	T39DE	3250
RDBF	5400	T11R3	0616	T2810A	2013	T39E	3237
RDBUF	4456	T11T	0641	T2810B	2015	T390K	3247

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T39R	3207	TCNTR4	0140	TST33	2400	XPRINT	0036
T39T	3252	TCNTR5	0141	TST34	2512	XPRN	0057
T3E	0346	TCNTR6	0142	TST35	2000	XRDAD	0046
T3T	0352	TEXAD	5770	TST36	2647	XROBF	0056
T40E	3276	TEXCA	5766	TST37	3000	XRDCM	0045
T40R	3255	TEXCH	5762	TST38	3100	XRDCR	0054
T40S	3261	TEXCR	5754	TST39	3200	XRDST	0044
T40T	3300	TEXDA	5764	TST4	0351	XREG	5162
T41E	3370	TEXDB	5760	TST40	3253	XRESTR	0024
T41R	3303	TEXDT	5772	TST41	3301	XRNAD	0022
T41S	3317	TEXEND	6740	TST42	3400	XSDKP	0047
T41T	3372	TEXGD	5752	TST43	3452	XSKWAT	0032
T42E	3447	TEXPC	5750	TST44	3515	XTEXT	5161
T42R	3402	TEXST	5756	TST45	3600	XTOCT	0061
T42S	3406	THSF LD	0035	TST5	0360	XWTSZ	0033
T42T	3451	TIMSTP	3536	TST6	0400		
T43E	3512	TMANE	4703	TST7	0415		
T43R1	3454	TMANOK	4702	TST8	0431		
T43R2	3461	TMANS	4624	TST9	0457		
T43T	3514	TMANT	4705	TSTSEK	4060		
T44E	3554	THPROT	4161	THOCT	4461		
T440K	3564	TOCT	6036	TYPE	4436		
T44R	3524	TOTST	5526	UPONE	6053		
T44T	3567	TOVRTD	4532	WATISZ	4433		
T45A1	3622	TRK212	0066	WRKBUF	7000		
T45A2	3676	TST0	0235	WTSZ	5247		
T45E	3743	TST1	0256	XCLDR	0053		
T45R1	3612	TST10	0512	XCOMP1	0042		
T45R2	3626	TST11	0600	XCOMP2	0043		
T45R3	3667	TST12	0656	XGR LF	0062		
T45R4	3701	TST13	0710	XDIN	0021		
T45SC	3004	TST14	1001	XDISKG	0025		
T45T	3745	TST15	1064	XDOU T	0020		
T4E	0355	TST16	1102	XERRO	0040		
T4T	0357	TST17	1122	XFGURE	0027		
T5E	0367	TST18	1200	XFLBUF	0030		
T5T	0371	TST19	1240	XFROCT	0060		
T6E	0412	TST2	0271	XGRONK	4164		
T6T	0414	TST20	1270	XGTREG	5160		
T7E	0426	TST21	1320	XHFCHK	0026		
T7T	0430	TST22	1400	XHI TRK	0064		
T8E	0454	TST23	1445	XIONWT	0041		
T8R	0433	TST24	1511	XKLBUF	0031		
T8T	0456	TST25	1600	XLAP	4165		
T9E	0507	TST26	1645	XL DAD	0052		
T90K	0506	TST27	1717	XL DCA	0051		
T9R	0464	TST28	1773	XL DCM	0050		
T9T	0511	TST29	2056	XL DHN	0055		
TAPROT	4775	TST3	0317	XL OTRK	0063		
TCNTR1	0135	TST30	2134	XNERR0	0037		
TCNTR2	0136	TST31	2177	XONLY	0023		
TCNTR3	0137	TST32	2247	XOVR RD	4166		

ERRORS DETECTED: 0
LINKS GENERATED: 7
RUN-TIME: 25 SECONDS
3K CORE USED

